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# Explicit Memory Bias for Body-Related Stimuli in Eating Disorders.

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**Explicit memory bias for body-related stimuli in eating disorders**

**Sebastian, Shannon Buckles, Ph.D.**

**The Louisiana State University and Agricultural and Mechanical Col., 1994**

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EXPLICIT MEMORY BIAS FOR BODY-RELATED STIMULI  
IN EATING DISORDERS

A Dissertation

Submitted to the Graduate Faculty of the  
Louisiana State University and  
Agricultural and Mechanical College  
in partial fulfillment of the  
requirements for the degree of  
Doctor of Philosophy

in

The Department of Psychology

by  
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August 1994

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## Abstract

This investigation studied the presence of an explicit memory bias for emotional body related stimuli in patients diagnosed with an eating disorder. Explicit memory refers to the recall of stimuli previously presented. Explicit memory tasks are thought to reflect cognitive elaboration mechanisms. Research on depressed patients has found a bias for recalling negatively valenced information and/or a bias against recalling positively valenced information. This study sought to extend this type of memory bias research to eating disorder patients.

Three groups were examined, a group of clinical eating disordered women (n=30), a group of weight preoccupied non-eating disordered individuals (n=30), and a control group without an eating disorder or weight preoccupation (n=30). Each group participated in an encoding task which presented words of three affective valences (emotional body related, non-emotional body related, and neutral). Subjects were instructed to imagine themselves in a scene involving each word. Following the encoding task, subjects were asked to recall these words in a free recall format. There was evidence of a memory bias for emotional body related words in eating disorder patients. There was no evidence for an explicit memory bias in weight preoccupied subjects. The groups did not differ in the recall of non-emotional body related or neutral words.

As predicted, eating disorder patients recalled more emotional body related words than the weight preoccupied or control groups. It is possible that eating disorder patients engage in greater elaboration of emotional stimuli related to body shape and weight than weight preoccupied normals. Thus, preoccupation with body shape and weight may not be sufficient to cause an explicit memory bias. Results suggest that the influence of depression and neuroticism on explicit memory bias is minimal.

## Introduction

Recently, the information processing paradigm has been applied to numerous psychological disorders. Much of this research has stemmed from Gordon Bower's associative network theory of memory. Bower's spreading activation model (Bower, 1981) proposed that memory is composed of associated networks which interact in a hierarchical fashion. In these networks, memories are associated with one another and with information relevant to the memories. In addition, each memory network is composed of "primitive emotion nodes." Bower proposes that each emotion has a corresponding node, or unit, in the memory system. Therefore, each emotion node is linked to memories of events that occurred in an individual's life when that particular emotion was experienced. Bower has noted that when an emotion node is activated, either by physiological or symbolic stimuli, excitation radiates to nodes that control the autonomic response and overt behavior of the specific emotion. Also, spreading activation diffuses to the memory structures that are related to the particular emotion. Thus, the activated emotion node will influence subsequent memories retrieved.

### Cognitive Models of Eating Disorders

The application of Bower's spreading activation model to disorders such as anxiety and depression spurred the development of cognitive models of eating disorders.

Cognitive research has employed various methodologies for investigating how knowledge from the experience of environmental stimuli is stored in memory and, also, how cognitive events influence behavior. To date, empirical investigations have focused on quantifying attentional and memory biases.

Cognitive scientists such as Anderson (1985) have proposed sensory information, as well as permanent information, play a role in cognitive processes in eating disorders. Anderson termed information as permanent when it serves to preserve sensory information as perceptual images as "perception-based knowledge representations." On the other hand, "meaning-based knowledge representations" are formed when conceptual information is abstracted from perceptual details. Similar to the ideas of Bower, Anderson theorized that "propositional units" represent the smallest units of knowledge and are arranged hierarchically. Information is organized to maximize bottom-up processing in which low-level basic processes lead to higher-order representations.

On the other hand, Abelson and Black (1986) appealed that humans use top-down processing to access knowledge. These authors contended that information is first processed at a broad level and later refined to reflect a specific situation. Schlundt and Johnson (1990) noted that the theories of Anderson (1985) and Abelson and Black

(1986) are not necessarily incompatible. Investigations of the bottom-up approach have offered conclusions about perception, categorization, and information storage. Whereas, studies examining the top-down approach have resulted in greater knowledge of schemata and behavioral scripts. More specifically, two types of schemata have been discussed as relevant to cognitive processes in eating disordered individuals: self-schemata and weight-related schemata.

Self-Schemata. Beck's (1967) cognitive model of emotional disorders suggested that individuals who are vulnerable to emotional disorders have dysfunctional cognitive structures, or schema. Schemata are complex units of knowledge that represent general concepts. Schemata serve to select and modify experiences in order to determine which aspects of information are most relevant and, accordingly, which information will be stored in memory. Thus, schema influence selective attention, encoding, and retrieval processes. Schemata most relevant to the psychopathology of eating disorders are self-schema. Self-schema influence cognitive representation of self-perception and behavior. Markus (1977) contended that self-schema are formed when the individual attempts to explain or understand his/her behavior. As experiences accumulate, self-schemata become increasingly resistant to inconsistent information. If

contradictory information is encountered frequently, self-schema gradually change to approximate the new knowledge.

Vitousek and Hollon (1990) have proposed that the core psychopathology of anorexia and bulimia nervosa is represented in organized cognitive structures, or schemata, that connect self-perception with beliefs about weight. In eating disorders, self-schemata are hypothesized to influence information processing concerning food and weight, and serve to maintain eating disorder symptomatology. Markus, Hamill, and Sentis (1987) examined the effect of self-schemata on processing of weight-relevant information. Results indicated that individuals who identified their self-concept with weight processed information concerning body shape, body fat, and food more quickly than individuals whose self-concept did not include the construct of weight. However, to date empirical evidence does not support the existence of distinct cognitive structures in anorexia or bulimia nervosa that are related to eating and weight concerns.

Weight-Related Schemata. Vitousek and Hollon (1990) have defined weight related schemata as cognitive structures that code information about what it means to be thin or fat, rather than schema about the status of the self as thin or fat. It is likely that anorexics and bulimics have developed extensive associative networks linking the construct of thinness to beauty, intelligence,

and self-control, for example. On the other hand, the construct of fatness is most likely linked to various personal weaknesses or imperfections. Due to a combination of cultural values and idiopathic learning history, Vitousek and Hollon have proposed that the meaning of weight will be more elaborated, idiosyncratic, and emotional for eating disordered as compared to non-eating disordered individuals.

Furthermore, in the context of information processing theories, schemata can include information about both the self and weight. These knowledge structures are termed "weight-related self-schemata," and are a combination of self-schemata and weight-related schemata. Weight-related self-schemata represent the specific psychopathology of anorexia and bulimia nervosa. Weight and shape become the criteria for evaluating the self. Eventually, beliefs about weight and shape influence virtually all aspects of the patient's life including affect, cognition, and behavior.

Schlundt and Johnson (1990) have offered a model of how cognitive events influence behavior in the eating disorders. The model assumes that all information processing stages occur within a biological and environmental context. The context provides a set of cues that are encoded as physical energy and become available for information processing through sensory channels.



Schlundt and Johnson conceive information processing as moving through a series of stages between input of information and output of behavior. The processes that occur at each stage depend on the output of the previous stage. Processing of information flows through the four stages of perception, interpretation, decision making, and response execution. In the model, the first stage of processing involves perceptual processing. At this stage, input from sensory channels is attended to, and biological and environmental cues are perceived. Since the capacity of the individual to process information is limited, "selective attention" determines which information in the environment is perceived. Selective attention is guided by information stored in long term memory. "Misidentification of cues" may occur if information stored in long term memory is incomplete or incorrect. In addition, the emotional state of the individual may influence accessibility of information in long term memory and result in misperception of cues.

The second stage involves the integration of cues into an overall interpretation of the environment. Schemata guide logic and conceptualization of information in long term memory. In turn, schemata influence retrieval of information. In this stage of processing, several types of cognitive errors may occur (e.g., all-or-

nothing thinking, catastrophic thinking, or overgeneralization).

In the third stage of processing, the individual decides how to behave by considering the response options that are linked to the interpretive schema. Maladaptive behavior may result if the individual considers the wrong set of potential outcomes, places unrealistic values on particular outcomes, or misjudges the likelihood of the outcome of a certain response. Following selection of a response, the chosen response is translated into a series of overt behaviors. Along with performance skills, the individual must utilize feedback to assist in monitoring and adjusting behavior with experience. The behaviors selected and their outcomes influence the cognitive schemata that were used in interpreting the situation and selecting the behaviors. Schemata are altered depending on how successful or unsuccessful the performance. Through this process, the relationship between behavior and the environment is continually modified over time.

#### Body Image in Eating Disorders

Schlundt and Johnson (1990) also discussed the concept of self-schemata in the eating disorders as it pertains to body image disturbance. These authors have contended that the cognitive theory of body images can be represented in a hierarchical fashion. At the lowest

level perception-based knowledge representations integrate numerous perceptions to form a composite body image. At the second level, body image is a meaning-based knowledge representation. At this level, facts are associated with perceptions of body parts. At the highest level, information about general appearance becomes part of the individual's self-schemata.

Schlundt and Johnson acknowledged that we know very little about how these concepts become associated with body image perception. However, once the body image is established, they propose hypothetical associations between long term memory, information processing, motivational systems, and environmental stimuli. In this model, the environment is depicted as a source of input for the information processing system and the target of output for behavior. In the information processing system, perception, interpretation, decision making, and response programming intervene between stimulus input and behavior. The information processing system interacts with the motivational components of affect and physiology, and the long term memory network. Long term memory is assumed to be organized hierarchically. Self-schemata, people schemata, object schemata, and action schemata are interconnected and consist of ideas, affect, and behavioral information. In summary, affective and physiological states feed into the information processing

system which interacts with memory to influence retrieval of related schemata. For example, if a person feels depressed, then the retrieval of schemata with links to negative affect nodes is likely.

#### Attentional Biases in Eating Disorders

Few studies have investigated mood congruent attentional processes in the eating disorders. Some have suggested that eating disorders lead to an "attentional bias" toward stimuli related to concerns about eating and body size / shape. Attentional shift is assumed to have occurred if there is a change in direction in which attention is focused so that the person becomes aware of a particular aspect of the environment. Investigations of selective attention have either examined how attention to stimuli facilitates or inhibits task performance.

Investigations of selective attention in the eating disorders have hypothesized that overconcern with body shape and weight may result in an attentional bias for body size and weight related stimuli. Garner and Bemis (1982) have suggested that preoccupation with body size in the eating disorders is due to increased time focusing on weight coupled with excessive concerns about thinness. Furthermore, Williamson, Barker, and Norris (in press) have contended that attentional bias may mediate fear of fatness and body image disturbance in the eating disorders. Williamson et al. have proposed that

attentional biases favoring fatness and thinness stimuli are driven by fear of fatness and the resulting overconcern about body size. Attention is drawn to thinness stimuli because such stimuli represent safety. Whereas, fatness related stimuli represent danger and fear of weight gain. Eventually, selective attention to fatness and thinness related environmental cues may result in body size disturbance and increased preference for thinness.

Two basic techniques have been adopted from cognitive research of anxiety and depression and used to investigate attentional biases in eating disorders: the Stroop task and dichotic listening tasks. The first research paradigm was developed by Stroop (1935). In this methodology, stimulus words are printed in different color inks. Subjects are instructed to state the color of each word while ignoring the word itself. In his original investigation, Stroop found that the latency to name the color of ink in which a word was printed was longer when the word was the name of a different color. Whereas, no interference occurred when color naming nonsense syllables.

In recent variations of the Stroop task, the words used are of specific affective valences, or emotional tone. The subject is instructed to name the color of ink in which each word is printed and response latency is

measured. Studies have consistently found slowing of color naming when stimuli are related to the subject's psychopathological concerns. For example, slowing of color naming has been found by presenting threatening words to generalized anxiety disorder patients (Mathews & MacLeod, 1985), spider related words to spider phobics (Watts, McKenna, Sharrock, & Trezise, 1986), and negatively valenced words to depressed subjects (Gotlib & McCann, 1984).

Only a few studies have investigated attentional processes in eating disorders. One such study (Channon, Hemsley, & de Silva, 1988) found that anorexic subjects were generally slower than controls in color naming all words; however, the interference effect was greatest with food related words. Likewise, Fairburn, Cooper, Cooper, McKenna, and Anastasiades (1991) and Cooper, Anastasiades, and Fairburn (1992) employed the Stroop methodology with bulimia nervosa patients. Results indicated that bulimics were slower than controls in color naming words related to eating, shape, and weight. In addition, Fairburn et al. failed to find the Stroop interference effect in female controls. Therefore, normative degrees of concern about eating, shape, and weight in females who are not excessively weight preoccupied may be insufficient to impact the information processing system.

In conclusion, available evidence has suggested that eating disordered individuals may selectively process information related to eating, shape, and weight. Ben-Tovim, Walker, Fok, and Yap (1989) proposed that food and shape-related anxiety disrupts cognitive processing and results in cognitive and behavioral interference. Various researchers have hypothesized about the cause of slowing on the Stroop task. The stage at which interference occurs remains to be determined. Attentional and response explanations have been offered; however, neither seems to provide an adequate account of the process behind Stroop interference. An alternative analysis might suggest that interference occurs at some stage between encoding and retrieval. It is at this intermediate stage that semantic meaning is assessed. However, in order to successfully investigate attentional processes in various psychological disorders, a clear differentiation of stages of processing must occur. Evidence to date suggests that anorexics and bulimics may not have an attentional bias, but may be distracted by body and food related stimuli.

The second technique utilized in investigations of cognitive processes in eating disorders is the dichotic listening task. Schotte, McNally, and Turner (1990) employed this technique with bulimia nervosa patients. In this procedure, subjects are presented with two prose passages, one to each ear. Subjects are instructed to

"shadow," or repeat aloud, the passage presented in one ear (attended channel) and ignore the passage presented in the other ear (unattended channel). During the listening task, subjects are asked to detect target words in each passage. Subjects usually detect targets in the attended channel without difficulty, but cannot easily identify targets from the unattended passage, unless the words are especially salient (e.g., one's name or emotionally significant words). Findings have indicated that bulimics detected target words related to body, shape, or weight more often than neutral words when both were presented in the unattended channel. Moreover, bulimics responded with larger skin conductance changes to words related to their concerns as compared to neutral words.

Overall, current evidence suggests that anorexia and bulimia nervosa patients selectively attend to stimuli related to body, shape, and weight; however, this does not necessarily mean that eating disordered subjects further elaborate on the stimuli in memory. Although attentional biases occur in eating disorders, the degree to which attention effects rehearsal and, in turn, memory must be investigated in greater detail.

#### Memory Biases in Eating Disorders

In addressing the issue of memory bias in eating disorders, two hypotheses are worthy of investigation. First, does a memory bias for body, shape, and weight



related stimuli exist in eating disordered individuals? Second, if an explicit memory bias exists, is it due to an encoding bias, a retrieval bias, or some intermediate process? For example, attention to a stimulus may not lead to encoding and elaboration on that stimulus in all instances. The stimuli, especially if anxiety producing, may be subsequently avoided. In addition, if a stimulus is encoded, retrieval is not guaranteed. Cues (emotional or contextual) relevant to the stimulus may be necessary to evoke the response. In other words, memories of the same context examined in different moods may change the affective valence of the memory. Investigators must focus on what factors underlie memory biases in eating disorders including attentional biases, encoding processes, or retrieval strategies.

Based upon empirical findings related to depressed and anxious patients, it is likely that eating disorder patients would exhibit a selective memory for information related to shape and weight. Although food and body related cognitions are common to all human beings, eating disordered individuals may manifest cognitions that are specific to fear of fatness and misperceptions of body shape and weight. This "content specificity" hypothesis of cognitive biases has been supported in studies of depression (Haaga, Dyck, & Ernst, 1991).

Clinical observations have demonstrated that eating disorder patients tend to recall positive or negative comments about their weight for lengthy periods of time. Other observational data on memory processes in eating disorders includes that anorexics tend to do well in school but appear to be deficient in general knowledge about the world. Also, the obsessive pursuit of thinness in anorexia and bulimia nervosa may be conceptualized as a focused cognitive style which requires considerable effortful processing (Strupp, Weingartner, Kaye, & Gwirtsman, 1986).

Only one published study to date has directly tested memory biases in eating disorders. Strupp et al. (1986) employed various presentation strategies to display neutrally valenced stimuli to anorexic subjects. The authors concluded that anorexia nervosa patients performed as well or better than control subjects on memory tasks that required cognitive effort, but performed more poorly than controls on memory tasks that required incidental, or automatic, learning. However, no published investigations have examined memory biases in eating disorders using stimuli relevant to the concerns of eating disordered patients (e.g., food, body, or weight related words).

In examining memory biases in various psychiatric disorders, four approaches have been utilized: free recall, cued recall, recognition, and word completion. In

these testing procedures (in respective order), subjects recall as many words as possible without assistance, complete word stems with letters to form words from a previous task, choose the words previously presented from a list, or complete presented words stems with the remaining letters of an unspecified word which may or may not have been presented in a previous task. Recognition has not been an effective recall task in examining memory biases. Neither contextual learning nor mood effects are elicited using recognition when additional influencing cues are present. It is believed that the presentation of the learned words over-rides the emotional filter (Bower & Cohen, 1982). Moreover, recognition differs from recall in that it eliminates the search through memory and only requires a judgment call.

#### Clinical Implications of Memory Bias

Teasdale (1983) has proposed a cyclical model which argues for memory biases as a maintenance variable in depression. Teasdale has claimed that a depressed state will result in negative memories becoming more accessible and, thus, recalled more often. Consequently, depression is maintained and, in turn, negative memories are increasingly accessible. A vicious cycle develops. Teasdale has further predicted that recall of negative events will lead to lowered expectations of coping skills and negative interpretations of environmental events.

It is likely that similar cognitive processes exist in persons with eating disorders. Since eating disordered individuals focus on weight related concerns, memories related to these concerns may become increasingly accessible at retrieval. In this, weight related concerns are strengthened. In addition, memories of weight related experiences (e.g., being teased about weight) may lead to negative interpretations of ambiguous body or weight related stimuli in the future. Lowered expectations of coping skills may result in bingeing and purging in bulimics or increased dietary restraint in anorexics.

#### Rationale

The literature using a free recall methodology has supported content specificity as an explanation for explicit memory bias for negatively valenced stimuli in depression. However, this phenomenon has not been examined in eating disorders. In the depression literature, Bower's associative network theory and Beck's self-schema theories have been used to explain the findings related to cognitive processes in depression, but no firm conclusions have been drawn. As noted by Watkins, Mathews, Williamson, and Fuller (1992) explicit memory may be due to several processes. Attentional biases, encoding processes, or retrieval strategies, or a combination of these, may interact with memory processes and result in explicit memory biases.

The eating disorder patient may have biased attention toward concern related stimuli (e.g., food, weight, or body stimuli) or such stimuli may be more salient in the environment of the eating disordered individual. Greater allocation of attention to relevant stimuli may make such stimuli more likely to be encoded. In order to test this hypothesis, attentional processes must be empirically tested. Furthermore, concern related stimuli may prevent the eating disorder patient from learning conflictual information. Thus, cognitive biases are maintained. It is likely that food, weight, or body related information distracts the eating disorder patient and prevents other information from being encoded.

Past studies have measured two types of memory: implicit and explicit memory. Implicit memory has been defined as the presentation of stimuli from a task affecting subsequent behavior even though the task may not be explicitly recalled. Various researchers have referred to implicit memory as procedural, reference, expectancy, and data driven memory. Explicit memory involves information that is directly accessible to conscious awareness. Explicit memory has also been termed declarative, working, semantic, and episodic memory. In this study, explicit memory for valenced stimuli will be measured.

Implicit and explicit memory may be influenced by encoding strategies. Encoding processes involve integration and elaboration (Mandler, 1980). Mandler has suggested that integration is involved in implicit memory, whereas, elaboration influences explicit memory. Integration is described as an automatic process which activates relevant schemata. The result is strengthening of the activated schema which then becomes more readily accessible to memory. Therefore, well integrated schemata can be activated when only a few components of the stimulus are presented. This process is illustrative of implicit memory.

Elaboration has been postulated to follow integration. Control processes mandate what particular information is processed and how it is processed. In elaboration, associative links are formed to related schema in the associative network. As evidenced in explicit memory, elaboration increases accessibility and retrievability of the schema.

It is possible that elaborative processes may be involved in hypothesized cognitive biases in eating disorder patients. Eating disorder patients may encode stimuli in a fashion that results in better recall of information related to a psychopathological concern. Watkins et al. (1992) noted that past research has found

free recall, as well as cued recall and word recognition, to be enhanced by semantic encoding conditions.

The present study will employ a self-referencing encoding task. Experimental paradigms have used self-referencing tasks which instruct subjects to relate to-be-encoded stimuli to themselves. These studies have consistently found that subjects are more likely to exhibit a mood congruent memory bias if encoded information was self-related. This process is similar to Beck's concept of "personalization" (Beck, Rush, Shaw, & Emery, 1979). Evidence from clinical observation has suggested that eating disorder patients tend to personalize ambiguous information, especially in relation to body, shape, or weight. Therefore, it is likely that eating disordered individuals will demonstrate a content specific self-referent recall bias in laboratory investigation.

The emotionality of stimuli has been postulated to influence memory. Mogg and Marden (1990) failed to find enhanced recall of non-emotional rowing related words by rowing team subjects. The authors concluded that stimuli must have emotional relevance as well as content relevance to the concerns of the subject. Selective memory for concern related stimuli may not occur when words are not emotionally salient. In the present study, emotional body related words and non-emotional body related words will be

included as stimuli in order to control for the emotion related to body words.

### Problem

The purpose of this study was to investigate explicit memory in eating disorders. This study compared three groups of individuals, a group of females diagnosed with anorexia nervosa, bulimia nervosa, or eating disorder not otherwise specified, a group of weight preoccupied non-eating disordered individuals, and a comparison group. All subjects were exposed to words of three affective valences (emotional body related, non-emotional body related, and neutral). Subjects participated in a task in which they imagined themselves in a scene which involved each word. Following this encoding task, subjects engaged in a filler task. Next, subjects engaged in a free recall explicit memory task in which they were instructed to recall words which they were exposed to earlier in the experimental session. Thus, the design of this study was a 3 (subject groups) x 3 (affective valence of verbal stimuli) design. This design is illustrated in Figure one. The predictions of this investigation are presented below.

Hypothesis 1: Eating disordered and weight preoccupied normals will be equated on Body Shape Questionnaire score. If weight preoccupation is a critical variable in determining memory bias, it is



predicted that eating disordered subjects and weight preoccupied subjects will recall proportionally more emotional body related words in the free recall task than the low weight preoccupied group. However, if the critical determinant of memory bias is not preoccupation with weight, but a variable particular to the clinical condition itself, it is predicted that clinical subjects will recall proportionally more emotional body related words in the free recall task than the weight preoccupied group. This hypothesis is predicted because of previous findings of explicit memory bias in depression.

Also, if preoccupation with weight is a determinant of memory bias, it is predicted that the weight preoccupied group will recall more emotional body related words than the low weight preoccupied group. However, if weight preoccupation is not a critical variable, then it is predicted that the weight preoccupied group will not differ from the low weight preoccupied controls on recall of emotional body related words.

The dependent variable (memory bias) will be defined one of two ways. If groups do not differ in number of neutral words recalled, the raw number of words recalled will serve as the memory bias score. However, if groups differ significantly on number of neutral words recalled, a corrected score equal to the difference between number

<u>Group</u>			
Eating Disorder	Weight Preoccupied	Control	
			Emotional Body Related
			Non-Emotional <u>Word</u> Body Related <u>Type</u>
			Neutral

DV: Number of correct words recalled on explicit memory task.

Figure 1  
Experimental Design

of body words and number of neutral words recalled will be the memory bias score.

Hypothesis 2: If emotionality of stimuli enhances memory bias, it is predicted that groups will not differ on number of non-emotional body related or neutral words recalled.

Hypothesis 3: Words recorded which were not presented during the encoding task (intrusions) will be categorized according to valence. It is predicted that clinical subjects and weight preoccupied subjects will have more body related intrusions than the control group.

Hypothesis 4: It is predicted that significant correlations will be found between measures of eating disorder symptomatology (EAT, BULIT) and weight preoccupation (BSQ), and number of emotional body related words recalled on the explicit memory task.

Hypothesis 5: It is predicted that the correlation between measures of eating disorder symptomatology (EAT, BULIT) and the number of neutral words and non-emotional body related words correctly recalled will not be significant.

Hypothesis 6: Based on the assumptions of Bower's associative network theory, severity of eating disorder symptomatology will cause subthreshold activation of concern-related nodes in memory. In order to examine whether the cause of memory bias is neuroticism or eating

disorder symptomatology, a series of analyses will be performed. Groups will differ significantly on depression and neuroticism as measured by the Beck Depression Inventory and the N-scale of the Eysenck Personality Questionnaire. Following removal of variance due to depression and neuroticism, it is predicted that group differences on memory bias will diminish.

It is predicted that measures of eating disorder symptomatology (EAT, BULIT) will be positively correlated with recall bias. If removal of variance due to depression or neuroticism results in a decreased correlation coefficient, then it will be concluded that depression or neuroticism may play a mediating role in memory bias.

Hypothesis 7: It is predicted that eating disordered and weight preoccupied subjects will respond proportionally faster than control subjects to emotional body related stimuli in the encoding task. This prediction will be tested by recording the response latency for subjects to press a key indicating that they have imagined a scene involving themselves and the presented word. This prediction is based on Bower's theory which states that mood congruent concepts have subthreshold activation. Therefore, imagining scenes related to weight preoccupation should be proportionally

faster. This hypothesis is not crucial to the basic purpose of this investigation.

Hypothesis 8: It is predicted that clinical subjects and weight preoccupied subjects will rate emotional body words as more unpleasant than the control group. Groups are not predicted to differ on pleasantness rating of non-emotional or neutral words.

## Method

### Subjects

Two experimental groups were included in this study. One experimental group consisted of thirty females with a primary eating disorder diagnosis: 10 anorexia nervosa; 10 bulimia nervosa; 10 eating disorder not otherwise specified. Consecutive eating disorder cases were identified from inpatient and outpatient admissions to the St. Clare unit of Our Lady of the Lake Regional Medical Center and the Psychological Services Center of Louisiana State University. Patients which agreed to participate were included in the study. Approximately 40 eating disorder cases were screened, and 35 met criteria for participation in the study. Of those, 30 agreed to participate. BSQ scores for the eating disorder group ranged from the lowest score of 90 to the highest score of 204. The eating disorder diagnosis was determined using a clinical interview (Interview for Diagnosis of Eating Disorders). Individuals in this group met the diagnostic criteria for anorexia nervosa, bulimia nervosa, or eating disorder not otherwise specified (NOS) as defined by the Diagnostic and Statistical Manual of Mental Disorders, the third revised version (DSM-III-R; American Psychiatric Association, 1987).

DSM-III-R inclusion criteria for a diagnosis of anorexia nervosa are as follows: (a) Refusal to maintain

body weight over a minimal normal weight for age and height. (b) Intense fear of weight gain or becoming fat, even though underweight. (c) Disturbance in the way in which one's body weight, size, or shape is experienced. (e) In females, the absence of at least three consecutive menstrual cycles when otherwise expected to occur.

DSM-III-R inclusion criteria for a diagnosis of bulimia nervosa are as follows: (a) Recurrent episodes of binge eating. (b) A feeling of lack of control over eating behavior during the eating binges. (c) The person regularly engages in either self-induced vomiting, use of laxatives or diuretics, strict dieting or fasting, or vigorous exercise in order to prevent weight gain. (d) A minimum average of two binge eating episodes a week for at least three months. (e) Persistent overconcern with body shape and weight.

Eating disorder not otherwise specified, as derived from proposed DSM-IV criteria (Wilson & Walsh, 1991), was defined as disorders of eating that do not meet criteria for either anorexia nervosa or bulimia nervosa. Inclusion criteria for subthreshold anorexia nervosa consisted of the following: (a) A patient who displays all of the usual features of anorexia nervosa but is not amenorrheic. (b) All of the criteria for anorexia nervosa are met except the abnormally low weight requirement. Inclusion criteria for subthreshold bulimia nervosa included the

following: (a) Eating binges accompanied by significant distress but without any regular compensatory behavior (e.g., vomiting or laxative abuse). (b) Eating binges with atypical compensatory mechanisms (e.g., abuse of diet pills). (c) Eating binges at a frequency of less than twice a week for 3 months. (d) Compensatory behavior in the absence of the consumption of a sufficiently large amount of food to meet the criteria for a binge. (e) A person who repeatedly chews but does not swallow large amounts of food. An eating disorder diagnosis was supported in staffing by a licensed psychologist for each of the clinical subjects.

The weight preoccupied experimental group consisted of thirty female undergraduate students at Louisiana State University who met inclusion criteria and agreed to participate in the study. Subjects were included in the study if they performed above a score of 106 on the Body Shape Questionnaire (BSQ; Cooper, Taylor, Cooper, & Fairburn, 1987). As reported by Cooper et al., this cutoff score is one standard deviation ( $sd=30$ ) below the mean for clinical groups on the BSQ. The cutoff score of 106 fell at the 85th percentile in the distribution of BSQ scores for control subjects included in this study. Of the 200 subjects which were screened, approximately 50 met criteria for inclusion in the weight preoccupied group. Of those individuals, 30 agreed to participate. BSQ



scores for the weight preoccupied group ranged from the lowest score of 107 to the highest score of 202. Of the 200 subjects screened, four subjects scored above 30 on the EAT and above 88 on the BULIT. These four subjects were interviewed with the IDED, and one subject was referred for eating disorder treatment. The control group consisted of thirty undergraduate female students at Louisiana State University who met inclusion criteria and agreed to participate in the study. To be included in this group, individuals were required to score below 90 on the BSQ. This score is one standard deviation ( $sd=20$ ) above the mean for control subjects completing the BSQ (Cooper et al., 1987). The cutoff score of 90 fell at the 92nd percentile in the distribution of BSQ scores for control subjects included in this study. Of the 200 students which were screened, approximately 150 met criteria for inclusion in the control group. Thirty of those individuals agreed to participate. BSQ scores for the control group ranged from the lowest score of 40 to the highest score of 89. Groups were matched for age ( $\pm$  three years), and verbal intelligence ( $\pm$  .5 s.d. on the Shipley Institute of Living Scale).

### Materials

Body Image Assessment (BIA; Williamson, Davis, Bennett, Goreczny, & Gleaves, 1989; Appendix A). The BIA consists of nine silhouette cards depicting a range of

female body sizes. Body image disturbance is measured by placing the cards in front of the subject in random order. The subject is then instructed to select the card which accurately depicts his or her current body size. Following selection of a card, the card number (which is on the back of the card) is recorded. The cards are retrieved and placed in front of the subject in random order a second time. The subject is instructed to select the card which depicts the "ideal" body size that would be most preferred. The card number is once again recorded. Current body size (CBS) and ideal body size (IBS) t-score estimates are calculated from normative data which is available for women of differing heights and weights. The normative data is used to determine the degree of body image distortion. In the present study, the BIA was used to examine whether weight preoccupied subjects (as defined by the Body Shape Questionnaire) suffer from body image disturbance.

Eating Attitudes Test (EAT; Garner & Garfinkel, 1979; Appendix B). The EAT is a 40 item multiple choice paper and pencil measure which assesses anorexic attitudes including restrictive eating patterns, fear of weight gain, and drive for thinness. This measure in conjunction with structured interview was used to determine if an eating disorder diagnosis was appropriate. A score of at least 30 is indicative of anorexia nervosa. Factor

analysis has revealed three factors on the EAT: dieting, bulimia and food preoccupation, and oral control or restraint. Garner and Garfinkel report adequate reliability and validity for this measure. A reliability coefficient of .79 was reported for clinical anorexics, and  $r=.94$  for clinical anorexics and normal controls. Concurrent validity between total EAT score and anorexic versus normal subjects was reported to be .87. Gross, Rosen, Leitenberg, and Willmuth (1986) reported that the EAT also discriminates between bulimics and controls. For purposes of the present study, the EAT score was used to assess restrictive eating behavior.

Bulimia Test (BULIT; Smith & Thelen, 1984; Appendix C). The BULIT is a 36 item multiple choice paper and pencil measure of symptomatology of bulimia nervosa. Performance on this measure was used along with structured clinical interview to determine appropriateness of an eating disorder diagnosis. A total score of at least 88 indicates the presence of bulimic behavior. A score of 102 signifies significant bulimic behavior. Factor analysis of the BULIT has resulted in 6 factors: vomiting, bingeing, negative feelings about bingeing, menstrual problems, preference for high calorie, easily ingested food, and weight fluctuations (Thelen, Mann, Pruitt, & Smith, 1987). In the present study, the BULIT served as a measure of the severity of bingeing and purgative

behavior. The authors report test-retest reliability to be .87 and concurrent validity as .54.

Interview for the Diagnosis of Eating Disorders (IDED; Williamson, Davis, Norris, & Van Buren, 1990; Appendix D). Subjects which scored above 88 on the BULIT or 30 on the EAT were recontacted and interviewed with the IDIED to evaluate for the presence of an eating disorder. The IDIED is a structured interview which collects information concerning diagnosing anorexia nervosa, bulimia nervosa, and compulsive binge eating. Following administration of the interview, the therapist completes likert type scales which assist the clinician in determining an eating disorder diagnosis. Interrater reliability and concurrent validity for the likert type scales is adequate.

Body Shape Questionnaire (BSQ; Cooper et al., 1987; Appendix E). The BSQ is a self-report instrument designed to measure body shape and weight concerns. Hadigan and Walsh (1991) reported that individuals diagnosed with bulimia nervosa scored significantly higher on the BSQ as compared to controls (141.6 versus 64.6, respectively). In the present study, the BSQ was used to discriminate high weight preoccupied individuals from low weight preoccupied individuals. Cutoff scores were derived from past research using the BSQ (Cooper et al., 1987). Inclusion criterion for the high weight preoccupied group

was a score greater than 106 on the BSQ, and the low weight preoccupied group consisted of individuals who scored below 90 on the BSQ.

Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh 1961; Appendix F). The BDI is a 21 item self-report measure of depression. Empirical validation on the BDI is extensive. Item-total correlations range from .31 to .68. Beck (1972) reported Spearman-Brown corrected split-half reliability to be .93. Test-retest reliability is estimated to be .75 for nonclinical populations (Miller & Seligman, 1973) and .49 for patient populations (May, Urquhart, & Tarran, 1969). In the present study, the BDI was used as an indicator of level of depression.

Visual Analogue Scale (VAS; Aitken, 1969; Appendix G). The VAS consists of a five point scale along a continuum with "no anxiety" at one end of the line and "extreme anxiety" at the opposite end of the line. The subject circles the number (one through five) which represents his or her current level of anxiety. The VAS appears to have adequate psychometric properties.

Subjective Units of Distress Scale (SUDS; Wolpe & Lazarus, 1966; Appendix H). On this scale, subjects rate subjective mood along a five point scale. "Normal mood" is at one pole and "extreme depressed mood" is at the

opposite pole. This brief scale has psychometric validation comparable to scales of greater length (Davies, Burrows, & Pyton, 1975; Zeally & Aitken, 1969).

Eysenck Personality Questionnaire (EPQ; Eysenck & Eysenck, 1963; Appendix I). The EPQ is a 90 item questionnaire which measures neuroticism (N), extraversion-introversion (E), and psychoticism (P). In the present study, the neuroticism scale (N) of the EPQ was used as a measure of trait anxiety and depression, which have been shown to be related to the construct of neuroticism. Measures of internal consistency of the EPQ subscales is adequate (.74-.85; N=.84). Test-retest reliability at one month ranged from .51 to .90, although most groups scored in the .80 to .90 range.

Shipley Institute of Living Scale (SILS; Pollack, 1942; Appendix J). This paper and pencil instrument was used as an estimate of verbal intelligence. The scale consists of a vocabulary score and an abstraction score which are summed to yield a total score. The total score has been found to reliably estimate a full scale Wechsler Adult Intelligence Scale (WAIS) score (Prado & Taub, 1966). Pollack (1942) presents validity data.

Verbal Stimuli (Appendix K). Stimulus words were derived from past studies (Markus, Hamill, & Sentis, 1987; Channon, Hemsley, & de Silva, 1988). Each of three categories of stimuli (emotional body related, non-

emotional body related, and neutral) consisted of 12 words. Six eating disorder patients and six non-eating disordered graduate students made qualitative judgments on each stimulus word as to whether the word was related to body (yes or no) and intensity of emotional response (11 point scale from extremely negative to extremely positive). Both groups rated emotional body related words as more negative than non-emotional body related words. There was no difference between ratings of non-emotional body and neutral words. Frequency ratings were obtained from Dahl's (1979) norms. ANOVA analyses indicated that words did not differ significantly on length or frequency (see Table 1). All words had a unique two, three, or four letter word stem.

Memory Questionnaire (Appendix L). A free recall (explicit) memory questionnaire was created for the purpose of this experiment. The questionnaire consisted of blank spaces in which subjects were instructed to list words which were previously presented on the computer screen. A maximum of ten minutes was permitted to complete the task. A scoring guide for acceptable words recalled is presented in Appendix M.

Computer Software. The Micro Experimental Laboratory (MEL; Schneider, 1988; Butler, 1988) was used to display the verbal stimuli and the filler tasks. Butler (1988) found that the MEL program accurately records reaction

Table 1

Mean Length, Frequency, and Judgment Rating of Verbal Stimuli by Word Type

	<u>Word Type</u>			F	p
	Emotional	Non-Emotional	Neutral		
Length	5.25 <sup>a</sup> (2.01)	6.17 <sup>a</sup> (4.39)	6.50 <sup>a</sup> (1.73)	.57	.99
Frequency	30.08 <sup>a</sup> (55.32)	31.17 <sup>a</sup> (65.01)	31.67 <sup>a</sup> (51.77)	.02	.57
ED Rating	-3.17 <sup>a</sup> (1.14)	+0.42 <sup>b</sup> (0.71)	+0.17 <sup>b</sup> (0.68)	161.48	.0001
Control Rating	-3.38 <sup>a</sup> (1.21)	+0.50 <sup>b</sup> (0.75)	0.00 <sup>b</sup> (0.62)	41.44	.0001

Note. F= Test statistic; Standard deviations appear below means in parentheses; Superscripts which differ indicate that the means differ significantly; ED= Eating Disorder.



times. The program was run on an IBM PC or compatible computer.

#### Procedure

Subject screening consisted of administration of the BSQ and the IDED. Weight and height were also measured.

Following review of all interview data with a licensed psychologist, appropriateness for inclusion in the experimental or control groups was determined. If a subject met inclusion criteria, she was recontacted to schedule participation in the computer task.

Encoding Task. Subjects were presented with emotional body related, non-emotional body related, and neutral verbal stimuli during the encoding task. Subjects were instructed that they would be participating in an imagination task which would include the presentation of the verbal stimuli. Each word was presented for a duration of ten seconds. During the ten second interval, subjects were asked to imagine themselves in a past, present, or future scene that involved themselves and the word. Subjects were instructed to press a key when they had imagined a scene involving themselves and the word. After the subject had imagined the scene, a message appeared on the monitor encouraging the subject to continue thinking about the scene. The subject rated the pleasantness of the scene on a scale from 1 (very unpleasant) to 10 (very pleasant). Subjects were

presented with seven practice trials prior to the experimental task. Following the practice trials, one experimental trial was presented for each word, for a total of 36 experimental trials.

Filler Task. Following completion of the encoding task, subjects participated in a six minute filler task. The filler task was included to separate the presentation of the encoding of the verbal stimuli from the memory test. In the filler task, groups of numbers or letters (nonword) were displayed on the monitor. Subjects were instructed to identify the groups as numbers or letters as quickly as possible.

Memory Task. Following the filler task, subjects were asked to complete the explicit memory questionnaire. The questionnaire involved a free recall task in which subjects were instructed as follows: "Please list all the words that you can recall that were presented to you earlier in the imagination task. If you are not sure, try to make your best guess. You will have a maximum time limit of 10 minutes to complete the list. You may list the words in any order you wish." A list of acceptable responses is presented in Appendix M. Following completion of the memory test, subjects were administered the EAT, BULIT, BIA, EPQ, SUDS, VAS, SILS, and BDI in random order.

## Statistics

Statistical Power. Power analysis using means and standard deviations from studies examining cognitive biases in depression via a free recall memory task indicate that with 80% power the present study would require approximately 20 subjects per group in order to find a difference in recall of .40 (effect size; Cohen, 1992). Differences between the eating disorder, weight preoccupied, and control groups were analyzed using an alpha level of .05.

Statistical Analyses. Since groups did not differ on number of neutral words recalled, raw memory test scores were used as the dependent variable. Subject characteristics were analyzed using multivariate analysis of variance (MANOVA) and univariate analysis of variance (ANOVA). Post hoc analyses were performed using Fisher's protected least significant difference (LSD) test (Kirk, 1982).

Hypotheses 1, 2, and 3 were analyzed with a multivariate analysis of variance (MANOVA) with one between subjects factor (group). An interaction between group and affective valence was predicted.

Pearson product-moment correlations were used to analyze hypotheses 4 and 5. A significant correlation was predicted in hypothesis 4 and a nonsignificant correlation was predicted in hypothesis 5.

Hypothesis 6 was investigated using a partial correlation to hold constant the variance accounted for by neuroticism.

Hypothesis 7 was analyzed using multivariate analysis of variance (MANOVA) for reaction time with one between subjects factor (group). A significant interaction was predicted.

Hypothesis 8 was analyzed using a multivariate analysis of variance (MANOVA) for pleasantness rating with one between subjects factor (group). A significant interaction was predicted.

Statistical analyses were performed as follows: A MANOVA including 3 eating disorder diagnostic groups (anorexia nervosa, bulimia nervosa, eating disorder not otherwise specified) and 2 non-eating disorder groups (weight preoccupied and control) was calculated. The group effect and the group x word type interaction were examined. Group response patterns were examined using contrasts. Contrasts were calculated between the eating disorder and non-eating disorder groups, within the eating disorder group, and within the non-eating disorder group. Contrasts were also calculated between eating disorder and non-eating disorder groups on number of emotional body related words as compared to non-emotional body related words and neutral words, and non-emotional body related words as compared to neutral words.

## Results

### Subject Characteristics

Multivariate analysis of variance (MANOVA), univariate analysis of variance (ANOVA), and post hoc LSD test ( $\alpha=.05$ ) were used to compare groups on EAT, BULIT, BSQ, CBS, CBST, IBS, BDI, EPQ-N, VAS, and SUDS. The results of the MANOVA and ANOVA are presented in Table 2. Multivariate analyses showed that group profiles differed for eating disorder measures (EAT, BULIT, BSQ, CBS, IBS, CBST, IBST) and depression/neuroticism measures (BDI, EPQ-N, VAS, SUDS). Univariate analyses indicated that the eating disorder group scored significantly higher than the weight preoccupied and control groups on the EAT and BULIT. The eating disorder group also scored significantly higher than the control group on the SUDS, a rating of subjective distress. No group differences were found for VAS or unadjusted IBS scores. However, group differences were found for adjusted IBS (IBST). Post hoc tests for IBST indicated that the eating disorder group scored lower than the weight preoccupied and control groups. Low IBST scores for the eating disorder group as compared to the weight preoccupied and control groups suggests that the eating disorder subjects were experiencing greater dissatisfaction with body size despite equivalent height and weight. The eating disorder group and the weight preoccupied group scored

Table 2

ANOVA and MANOVA Results and Means of Subject Characteristic Variables by Group

Variable	ANOVA		Group		
	F	p	Eating Disorder	Weight Preoccupied	MANOVA Control F
Age	1.36	.26	22.73 <sup>a</sup> (7.57)	20.36 <sup>a</sup> (4.71)	21.23 <sup>a</sup> (3.96)
Height	.28	.76	64.40 <sup>a</sup> (2.30)	64.80 <sup>a</sup> (2.34)	64.77 <sup>a</sup> (2.34)
Weight	1.24	.29	120.77 <sup>a</sup> (22.25)	127.97 <sup>a</sup> (16.74)	127.40 <sup>a</sup> (19.66)
I.Q.	1.61	.21	98.93 <sup>a</sup> (9.60)	102.17 <sup>a</sup> (7.46)	98.40 <sup>a</sup> (9.18)
<hr/>					
EAT*	22.89	.0001	43.27 <sup>a</sup> (22.32)	31.80 <sup>b</sup> (20.06)	12.37 <sup>c</sup> 11.56 (7.65)
BULIT*	24.89	.0001	92.20 <sup>a</sup> (25.66)	76.47 <sup>b</sup> (24.20)	52.47 <sup>c</sup> (14.27)
BSQ*	95.87	.0001	147.50 <sup>a</sup> (28.80)	134.30 <sup>a</sup> (26.33)	67.67 <sup>b</sup> (14.04)
CBS*	7.56	.0009	4.83 <sup>ab</sup> (2.07)	5.67 <sup>a</sup> (1.73)	3.83 <sup>b</sup> (1.66)
IBS	2.89	.06	2.40 <sup>a</sup> (1.69)	3.07 <sup>a</sup> (1.20)	3.13 <sup>a</sup> (0.90)
CBST*	8.97	.0003	56.43 <sup>a</sup> (13.76)	59.63 <sup>a</sup> (14.50)	45.70 <sup>b</sup> (11.61)
IBST*	4.31	.02	39.17 <sup>b</sup> (15.50)	47.13 <sup>a</sup> (11.60)	47.57 <sup>a</sup> (9.59)

(table con'd.)

Table 2 (Con'd)

Variable	ANOVA		Group			MANOVA F
	F	p	Eating Disorder	Weight Preoccupied	Control	
BDI*	11.38	.0001	19.77 <sup>a</sup> (12.26)	16.73 <sup>a</sup> (14.99)	5.70 <sup>b</sup> (7.66)	5.82
EPQ-N*	20.34	.0001	16.83 <sup>a</sup> (3.97)	14.33 <sup>a</sup> (4.43)	9.20 <sup>b</sup> (5.62)	
VAS	.90	.41	2.53 <sup>a</sup> (1.11)	2.23 <sup>a</sup> (1.01)	2.20 <sup>a</sup> (1.06)	
SUDS*	3.97	.02	2.33 <sup>a</sup> (1.32)	2.00 <sup>ab</sup> (1.05)	1.53 <sup>b</sup> (0.90)	

Note. \* indicates that groups differed significantly on the variable; F= Test Statistic; p= Probability that F is significantly different from zero; Superscripts in each row which differ indicate that the means differ significantly; Standard deviations are presented in parentheses below means; MANOVA group differences for eating disorder measures (EAT, BULIT, BSQ, CBS, IBS, CBST, IBST) and depression/neuroticism measures (BDI, EPQ-N, VAS, SUDS) were significant ( $p < .0001$ ); EAT= Eating Attitudes Test; BULIT= Bulimia Test; BSQ= Body Shape Questionnaire; CBS= Current Body Size Estimate; IBS= Ideal Body Size Estimate; CBST= Current Body Size Estimate T-Score; IBST= Ideal Body Size Estimate T-Score; BDI= Beck Depression Inventory; EPQ-N= Eysenck Personality Questionnaire Neuroticism Scale; VAS= Visual Analogue Scale; SUDS= Subjective Units of Distress Scale.

significantly higher than the control group on the EAT, BULIT, BSQ, CBST, BDI, and EPQ-N. High CBST scores indicates the presence of body image disturbance in the eating disorder and weight preoccupied groups as compared to the control group. The eating disorder and weight preoccupied groups scored significantly higher than the control group on the BDI and EPQ-N. No group differences were found for age, height, weight, or I.Q..

Within the clinical eating disorder group, there were 10 subjects in each of three diagnostic groups (anorexia nervosa, bulimia nervosa, and eating disorder not otherwise specified). These three subgroups were compared using MANOVA and ANOVA. Multivariate analyses indicated that the eating disorder diagnostic group profiles differed for eating disorder measures (EAT, BULIT, BSQ, CBS, IBS, CBST, IBST) but did not differ for depression/neuroticism measures (BDI, EPQ-N, VAS, SUDS). ANOVA indicated that the bulimia nervosa diagnostic group scored significantly higher than the anorexia nervosa and the eating disorder not otherwise specified (NOS) diagnoses on the BULIT. The three diagnostic groups did not differ on age, height, weight, I.Q., BDI, EPQ-N, BSQ, EAT, IBS, IBST, VAS, or SUDS. ANOVA for CBS and CBST approached significance, with the anorexia nervosa and bulimia nervosa diagnoses scoring higher than the eating disorder NOS diagnoses. These data are summarized in Table 3.



Table 3

ANOVA and MANOVA Results and Means of Subject  
Characteristic Variables by Diagnosis

Variable	ANOVA		<u>Diagnosis</u>			MANOVA F
	F	p	Anorexia Nervosa	Bulimia Nervosa	Eating Disorder NOS	
Age	.34	.72	23.00 <sup>a</sup> (8.34)	21.20 <sup>a</sup> (5.33)	24.00 <sup>a</sup> (9.07)	
Height	1.09	.35	65.20 <sup>a</sup> (2.15)	64.30 <sup>a</sup> (2.06)	63.70 <sup>a</sup> (2.63)	
Weight	2.91	.07	112.40 <sup>a</sup> (18.12)	133.60 <sup>a</sup> (26.09)	116.30 <sup>a</sup> (17.40)	
I.Q.	.92	.41	97.30 <sup>a</sup> (13.02)	97.20 <sup>a</sup> (7.27)	102.30 <sup>a</sup> (7.47)	
EAT	1.03	.37	49.90 <sup>a</sup> (24.87)	44.20 <sup>a</sup> (16.94)	35.70 <sup>a</sup> (24.22)	3.89
BULIT*	18.27	.0001	75.60 <sup>b</sup> (17.06)	119.00 <sup>a</sup> (16.94)	82.00 <sup>b</sup> (22.47)	
BSQ	.27	.77	150.40 <sup>a</sup> (33.50)	141.90 <sup>a</sup> (24.80)	150.20 <sup>a</sup> (29.71)	
CBS	3.05	.06	5.40 <sup>a</sup> (1.96)	5.50 <sup>a</sup> (1.43)	3.60 <sup>a</sup> (2.31)	
IBS	.23	.80	2.10 <sup>a</sup> (1.85)	2.50 <sup>a</sup> (1.84)	2.60 <sup>a</sup> (1.51)	
CBST	3.10	.06	61.20 <sup>a</sup> (12.28)	59.90 <sup>a</sup> (6.62)	48.20 <sup>a</sup> (17.37)	
IBST	.20	.82	37.80 <sup>a</sup> (19.19)	37.90 <sup>a</sup> (11.33)	41.80 <sup>a</sup> (16.30)	

(table con'd.)

Table 3 (Con'd)

Variable	ANOVA		<u>Diagnosis</u>			MANOVA F
	F	p	Anorexia Nervosa	Bulimia Nervosa	Eating Disorder NOS	
BDI	.15	.86	20.60 <sup>a</sup> (16.00)	20.70 <sup>a</sup> (7.65)	18.00 <sup>a</sup> (12.83)	.73
EPQ-N	1.20	.32	15.90 <sup>a</sup> (5.51)	16.20 <sup>a</sup> (2.94)	18.40 <sup>a</sup> (2.80)	
VAS	.18	.84	2.50 <sup>a</sup> (1.30)	2.40 <sup>a</sup> (1.07)	2.70 <sup>a</sup> (1.06)	
SUDS	.46	.64	2.50 <sup>a</sup> (1.34)	2.00 <sup>a</sup> (1.25)	2.50 <sup>a</sup> (1.43)	

Note. \* indicates that groups differed significantly on the variable; F= Test Statistic; p= Probability that F is significantly different from zero; Superscripts in each row which differ indicate that the means differ significantly; Standard deviations are presented in parentheses below means; MANOVA group differences for eating disorder measures (EAT, BULIT, BSQ, CBS, IBS, CBST, IBST) were significant ( $p < .0003$ ); MANOVA group differences for depression/neuroticism measures (BDI, EPQ-N, VAS, SUDS) were nonsignificant ( $p = .66$ ); NOS= Not Otherwise Specified; EAT= Eating Attitudes Test; BULIT= Bulimia Test; BSQ= Body Shape Questionnaire; CBS= Current Body Size Estimate; IBS= Ideal Body Size Estimate; CBST= Current Body Size Estimate T-Score; IBST= Ideal Body Size Estimate T-Score; BDI= Beck Depression Inventory; EPQ-N= Eysenck Personality Questionnaire Neuroticism Scale; VAS= Visual Analogue Scale; SUDS= Subjective Units of Distress Scale.

### Analysis of Explicit Memory Data

The serial position effect did not occur in the memory data of the present study. As can be seen in Table 4, the eating disorder group recalled a higher number of emotional body related words across serial positions. Thus, memory data can be examined without consideration of serial position.

The number of words correctly recalled was calculated for each valence and scores were subjected to multivariate profile analysis of variance (MANOVA). The MANOVA contrasted recall scores for three eating disorder diagnostic groups (anorexia nervosa, bulimia nervosa, eating disorder not otherwise specified), and two non-eating disordered groups (weight preoccupied group and control groups). The MANOVA for free recall indicated a significant main effect for group ( $F(12,219)=1.99, p<.03$ ). Results of this analysis showed that group recall profiles differed significantly. A significant interaction between group and word type ( $F(8,168)=2.42, p<.02$ ) indicated that the recall patterns for groups differed as a function of word type. Group means are presented in Table 5 and the mean recall profiles are illustrated in Figures 2 and 3.

Contrast analyses indicated that the recall pattern of the eating disorder groups was different from the recall pattern of the non-eating disorder groups ( $F(2,84)=7.36, p<.001$ ). Recall patterns were

Table 4

Serial Position Data: Means by Group

<u>Serial Position</u>	<u>Group</u>		
	<u>Eating Disorder</u>	<u>Weight Preoccupied</u>	<u>Control</u>
-----Emotional Body Related Words-----			
(1-3)	13.67 (2.08)	8.67 (3.22)	5.67 (4.51)
(4-6)	21.00 (5.20)	16.67 (9.71)	18.00 (5.29)
(7-9)	19.67 (1.53)	15.33 (5.69)	15.67 (1.16)
(10-12)	21.33 (6.11)	15.00 (7.21)	18.00 (1.73)
-----Non-Emotional Body Related Words-----			
(1-3)	7.33 (3.79)	3.67 (3.51)	8.67 (2.08)
(4-6)	15.33 (5.86)	16.67 (3.22)	15.33 (3.22)
(7-9)	15.67 (3.79)	15.67 (3.22)	14.33 (5.03)
(10-12)	19.33 (2.52)	15.33 (2.52)	15.33 (4.51)
-----Neutral Words-----			
(1-3)	8.33 (1.53)	14.00 (5.20)	10.00 (2.00)
(4-6)	12.00 (4.36)	13.67 (4.93)	14.67 (2.31)
(7-9)	12.33 (2.89)	11.00 (8.66)	15.00 (6.08)
(10-12)	8.33 (1.53)	12.00 (1.73)	11.00 (4.36)

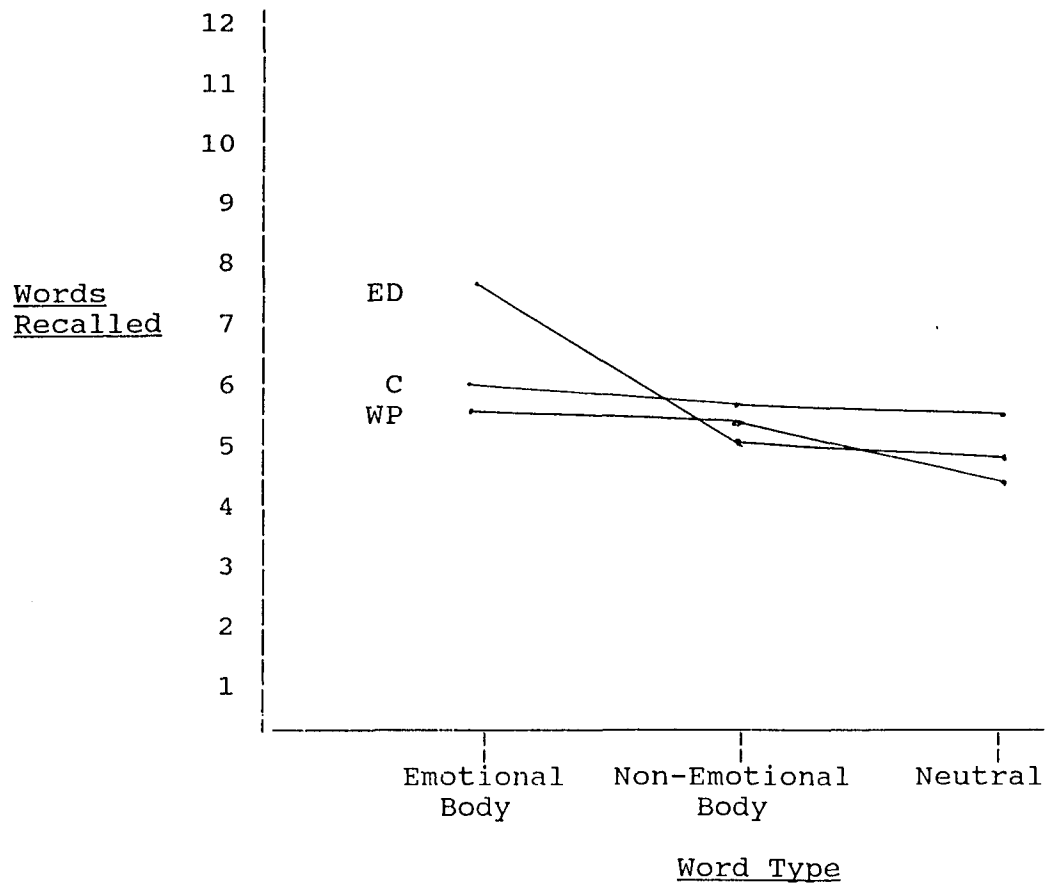
Note. Means are followed by standard deviations in parentheses.

Table 5

Memory Data: Means by Group

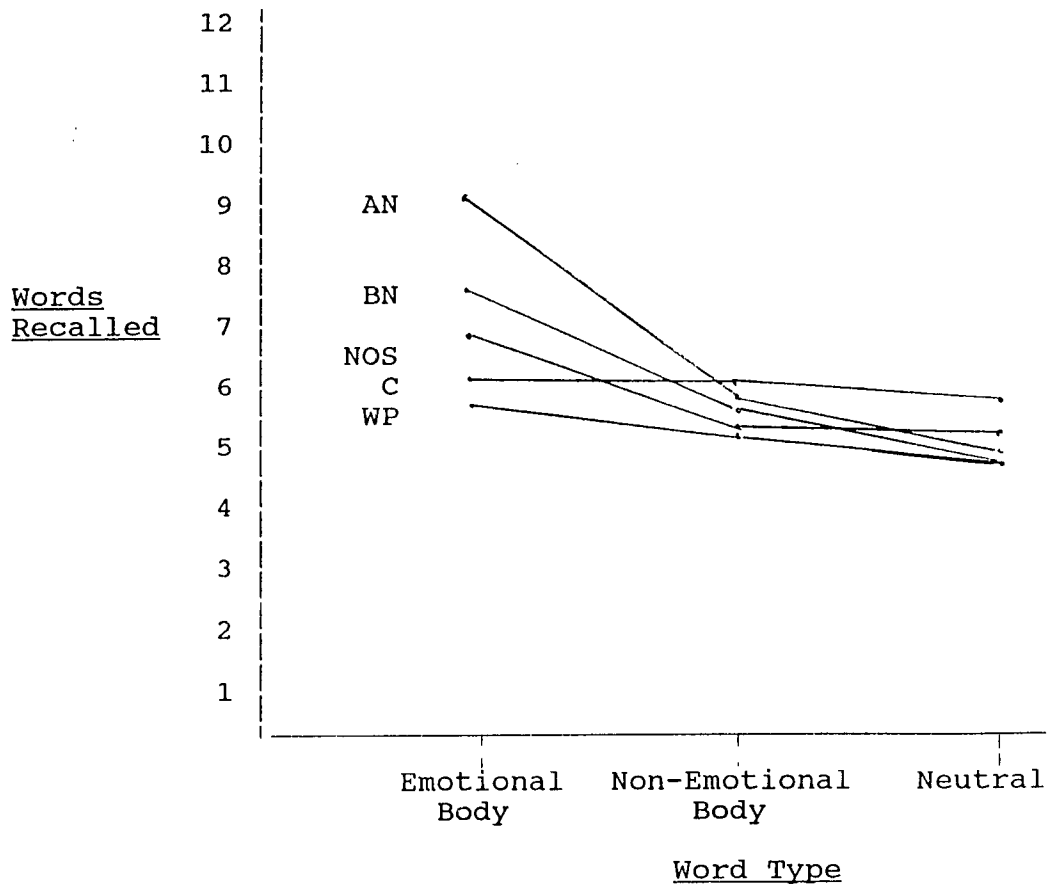
<u>Group</u>	<u>Word Type</u>		
	<u>Emotional</u> <u>Body Related</u>	<u>Non-Emotional</u> <u>Body Related</u>	<u>Neutral</u>
Anorexia Nervosa	8.70 (2.21) <sup>a</sup>	5.70 (2.41) <sup>b</sup>	5.00 (2.67) <sup>b</sup>
Bulimia Nervosa	7.20 (2.30) <sup>a</sup>	5.50 (1.43) <sup>b</sup>	5.30 (2.50) <sup>b</sup>
Eating Disorder NOS	6.60 (2.59) <sup>a</sup>	4.80 (2.44) <sup>b</sup>	4.50 (3.03) <sup>b</sup>
Weight Preoccupied	5.70 (2.22) <sup>b</sup>	5.47 (1.18) <sup>b</sup>	4.67 (2.02) <sup>b</sup>
Control	5.77 (2.30) <sup>b</sup>	5.63 (2.58) <sup>b</sup>	5.57 (2.65) <sup>b</sup>
<hr/>			
Eating Disorder	7.50 (2.46) <sup>a</sup>	5.33 (2.11) <sup>b</sup>	4.93 (2.66) <sup>b</sup>
Non-Eating Disorder	5.74 (2.37) <sup>b</sup>	5.55 (1.98) <sup>b</sup>	5.12 (2.43) <sup>b</sup>

Note. Means are followed by standard deviations in parentheses; NOS= not otherwise specified; Superscripts which differ indicate that the means differ significantly.



Note. WP= Weight Preoccupied; C= Control;  
ED= Eating Disorder.

Figure 2  
Explicit Memory Results: Three Group



Note. WP= Weight Preoccupied; C= Control;  
 NOS= Eating Disorder Not Otherwise  
 Specified; AN= Anorexia Nervosa; BN=  
 Bulimia Nervosa.

Figure 3

Explicit Memory Results: Five Group

not different for the three eating disorder diagnostic groups ( $F(4,168)=.80$ ,  $p=.53$ ) nor for non-eating disorder groups (weight preoccupied and control groups;  $F(2,84)=1.11$ ,  $p=.33$ ). Recall of emotional body related words as compared to non-emotional body related and neutral words differed for the eating disorder diagnostic groups as compared to the non-eating disorder groups ( $F(4,85)=4.52$ ,  $p<.002$ ). Recall of non-emotional body related words as compared to neutral words did not differ for the eating disorder diagnostic groups as compared to the non-eating disorder groups ( $F(4,85)=.39$ ,  $p=.81$ ).

#### Analysis of Intrusions

Words recorded by subjects during the free recall explicit memory task which were not presented during the encoding task were categorized according to word type. A MANOVA with one between subjects factor (group) was calculated. Results indicated a significant main effect for group ( $F(6,170)=2.79$ ,  $p<.01$ ). The group x word type interaction was also statistically significant ( $F(4,172)=3.73$ ,  $p<.006$ ). Examination of the means indicates that the eating disorder group had fewer neutral intrusions than the non-eating disorder groups. These data are presented in Table 6 and Figure 4.

Contrast analyses indicated that the intrusion pattern of the eating disorder groups differed from the intrusion pattern of the non-eating disorder groups

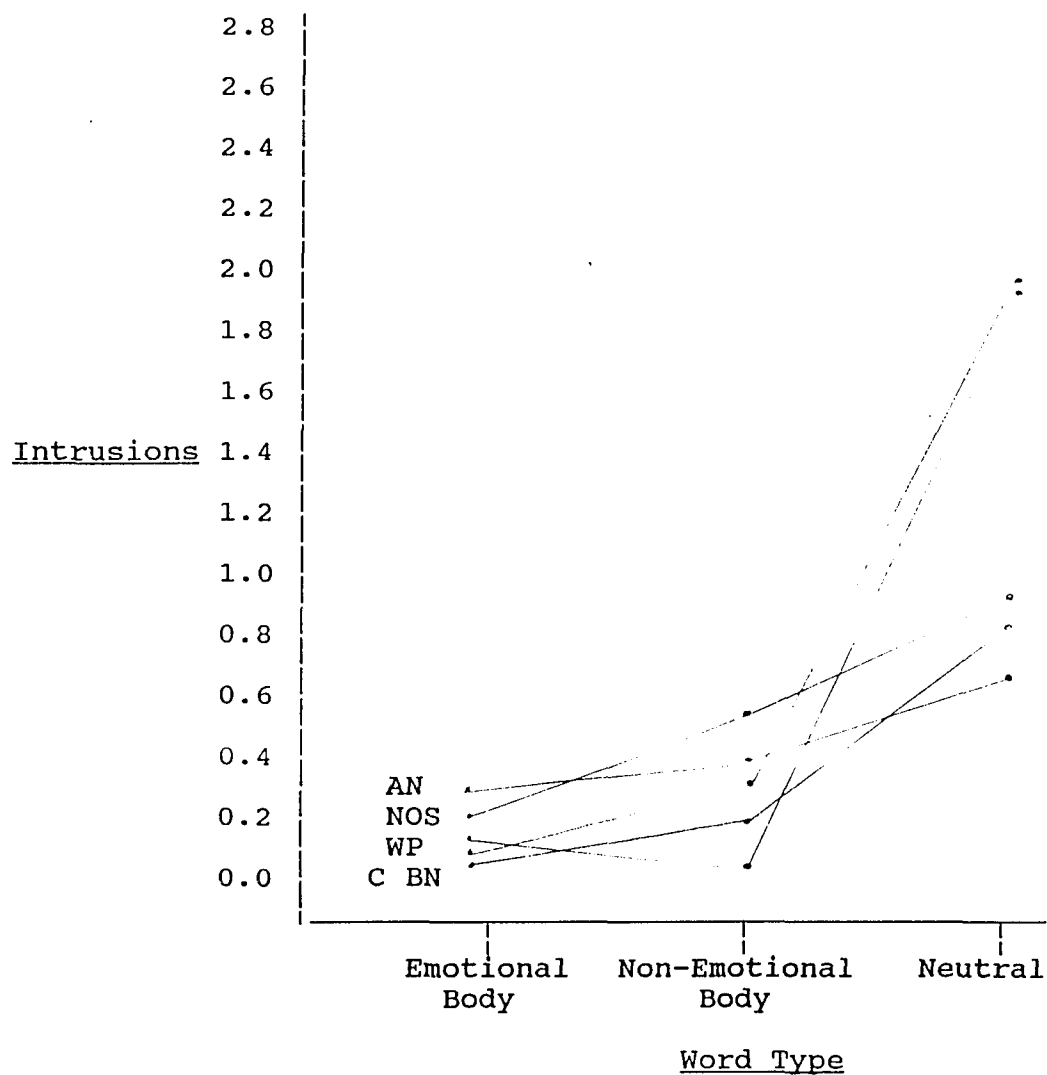


Table 6

Memory Intrusions: Means by Group

<u>Group</u>	<u>Word Type</u>		
	<u>Emotional</u> <u>Body Related</u>	<u>Non-Emotional</u> <u>Body Related</u>	<u>Neutral</u>
Anorexia Nervosa	.30 (.67) <sup>a</sup>	.40 (1.26) <sup>a</sup>	.70 (1.13) <sup>a</sup>
Bulimia Nervosa	.10 (.32) <sup>a</sup>	.20 (.42) <sup>a</sup>	.92 (1.25) <sup>a</sup>
Eating Disorder NOS	.20 (.63) <sup>a</sup>	.60 (.97) <sup>a</sup>	.99 (1.15) <sup>a</sup>
Weight Preoccupied	.13 (.35) <sup>a</sup>	.07 (.25) <sup>a</sup>	2.00 (1.82) <sup>b</sup>
Control	.10 (.31) <sup>a</sup>	.37 (.85) <sup>a</sup>	2.00 (1.84) <sup>b</sup>
<hr/>			
Eating Disorder	.20 (.55) <sup>a</sup>	.40 (.93) <sup>a</sup>	.87 (1.14) <sup>a</sup>
Non-Eating Disorder	.12 (.38) <sup>a</sup>	.22 (.59) <sup>a</sup>	2.00 (1.84) <sup>b</sup>

Note. Means are followed by standard deviations in parentheses; NOS= not otherwise specified; Superscripts which differ indicate that the means differ significantly.



Note. WP= Weight Preoccupied; C= Control;  
 NOS= Eating Disorder Not Otherwise  
 Specified; AN= Anorexia Nervosa; BN=  
 Bulimia Nervosa.

Figure 4

Intrusion Data

( $F(2,84)=6.77$ ,  $p<.002$ ). Intrusion patterns were not different for eating disorder diagnostic groups ( $F(4,168)=1.24$ ,  $p=.29$ ), nor for non-eating disorder groups ( $F(2,84)=1.27$ ,  $p=.28$ ). Intrusions of emotional body related words as compared to non-emotional body related and neutral words differed for the eating disorder diagnostic groups as compared to the non-eating disorder groups ( $F(4,85)=4.82$ ,  $p<.002$ ). Intrusions of non-emotional body related words as compared to neutral words differed for the eating disorder diagnostic groups as compared to the non-eating disorder groups ( $F(4,85)=4.22$ ,  $p<.001$ ).

#### Correlation Analyses

Correlations between subject scores on the EAT, BULIT, BSQ, BDI, and EPQ-N and memory scores were calculated across groups. The EAT, BULIT, and BDI were positively correlated with the number of emotional body related words recalled, but the correlations were relatively weak. Correlations between these same variables were not significantly correlated with number of non-emotional body related words. A modest negative correlation was found between EPQ-N and recall of neutral words. These correlations are summarized in Table 7.

To further investigate the contribution of depression and neuroticism to the positive correlations between EAT, BULIT, and BSQ, and number of emotional body related words

Table 7

Correlation Analyses: Across Groups

		<u>Word Type</u>		
Objective Measures		Emotional Body	Non-Emotional Body	Neutral
EAT	<u>r</u>	.26*	-.10	-.04
BULIT	<u>r</u>	.25*	-.03	-.0006
BSQ	<u>r</u>	.19	-.04	-.14
BDI	<u>r</u>	.22*	-.11	-.13
EPQ-N	<u>r</u>	.11	-.18	-.23*

Note. r= Correlation Coefficient; \* indicates that the correlation was significant at  $p < .05$ ; EAT= Eating Attitudes Test; BULIT= Bulimia Test; BSQ= Body Shape Questionnaire; BDI= Beck Depression Inventory; EPQ-N= Eysenck Personality Questionnaire Neuroticism Scale.

recalled, partial correlations holding constant the variance due to BDI and EPQ-N were calculated. Holding constant the variance due to BDI resulted in lowered correlations between number of emotional body related words recalled and EAT ( $r=.26$ ,  $p<.01$ ; partial  $r=.15$ ,  $p=.15$ ), BULIT ( $r=.25$ ,  $p<.02$ ; partial  $r=.18$ ,  $p=.09$ ), and BSQ ( $r=.19$ ,  $p=.08$ ; partial  $r=.05$ ,  $p=.61$ ). When variance due to EPQ-N was held constant, correlations did not change significantly between number of emotional body related words recalled and EAT ( $r=.26$ ,  $p<.01$ ; partial  $r=.23$ ,  $p<.03$ ), BULIT ( $r=.25$ ,  $p<.02$ ; partial  $r=.23$ ,  $p<.03$ ), and BSQ ( $r=.19$ ,  $p=.08$ ; partial  $r=.15$ ,  $p=.17$ ). The pattern of correlations reflects group differences reported earlier on memory of emotional body related words. Thus, correlation results do not add to information derived from evaluation of group differences.

#### Analysis of Reaction Time Data

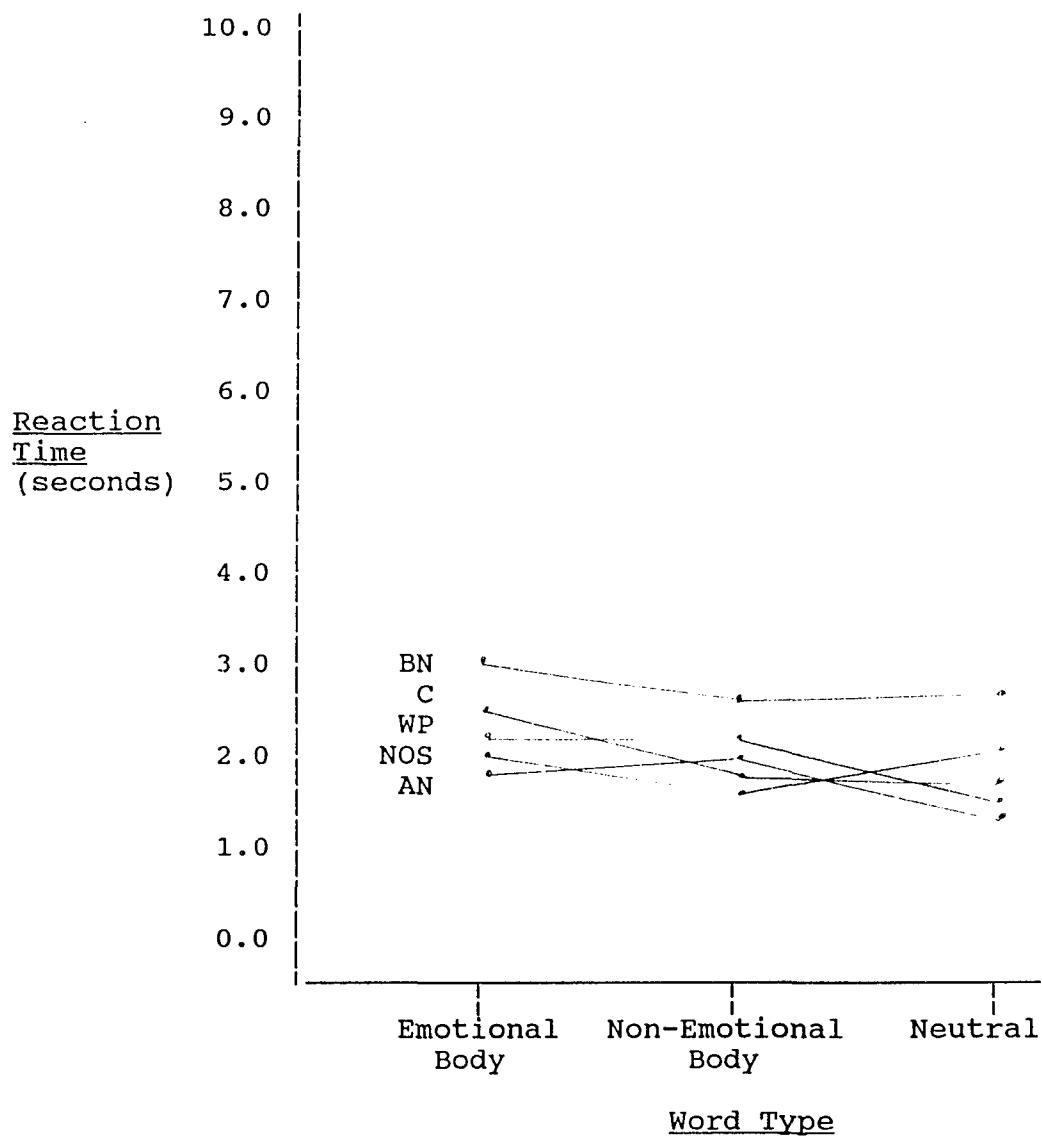
In order to examine response latency for subjects to imagine themselves in a scene with words presented of different valences, a MANOVA was calculated with one between subjects factor (group). Results of the MANOVA indicated no significant main effect for group ( $F(6,170)=.77$ ,  $p=.60$ ). The interaction between group and word type was also nonsignificant ( $F(4,172)=.99$ ,  $p=.41$ ). Table 8 and Figure 5 summarize the mean reaction times for each group.

Table 8

Reaction Time Data (in seconds): Means by Group

<u>Group</u>	<u>Word Type</u>		
	Emotional Body Related	Non-Emotional Body Related	Neutral
Anorexia Nervosa	1.82 (1.60) <sup>a</sup>	2.09 (1.06) <sup>a</sup>	1.85 (1.01) <sup>a</sup>
Bulimia Nervosa	3.08 (2.22) <sup>a</sup>	2.71 (1.72) <sup>a</sup>	2.96 (2.14) <sup>a</sup>
ED NOS	1.87 (1.17) <sup>a</sup>	1.90 (1.90) <sup>a</sup>	2.26 (1.25) <sup>a</sup>
WP	2.14 (1.44) <sup>a</sup>	2.15 (1.40) <sup>a</sup>	1.95 (1.06) <sup>a</sup>
Control	2.30 (1.22) <sup>a</sup>	2.08 (1.06) <sup>a</sup>	2.07 (1.27) <sup>a</sup>
-----			
Eating Disorder	2.26 (1.57) <sup>a</sup>	2.23 (1.26) <sup>a</sup>	2.36 (1.51) <sup>a</sup>
Non-ED	2.22 (1.43) <sup>a</sup>	2.12 (1.43) <sup>a</sup>	2.01 (1.36) <sup>a</sup>

Note. Means are followed by standard deviations in parentheses; NOS= not otherwise specified; ED= Eating Disorder; WP= Weight Preoccupied; Superscripts which differ indicate that the means differ significantly.



Note. WP= Weight Preoccupied; C= Control; NOS= Eating Disorder Not Otherwise Specified; AN= Anorexia Nervosa; BN= Bulimia Nervosa.

Figure 5

Reaction Time Data

### Analysis of Pleasantness Ratings

After subjects imagined themselves in a scene using a word, they rated the pleasantness or unpleasantness of the scene which they had imagined. Ratings were analyzed using MANOVA. A significant main effect was found for group ( $F(6,170)=5.36, p<.0001$ ). The group x word type interaction was also significant ( $F(4,172)=3.17, p=.02$ ). Profile analysis indicated that the groups rated their imagery differently. Examination of the means indicates that the eating disorder group rated emotional body related scenes as more negative than the non-eating disorder groups. Overall, scenes imagined with emotional body words were rated as least pleasant ( $M=3.38$ ), followed by non-emotional body word scenes ( $M=6.48$ ). Scenes imagined involving neutral words were rated as most pleasant ( $M=7.30$ ). Group means for these ratings are summarized in Table 9 and Figure 6.

Contrast analyses indicated that the rating patterns for the eating disorder groups and the non-eating disorder groups did not differ ( $F(2,84)=1.30, p=.28$ ). The rating pattern for the eating disorder diagnostic groups did not differ ( $F(4,168)=.65, p=.62$ ), but the rating patterns differed for non-eating disorder groups ( $F(2,84)=5.06, p<.008$ ). Ratings of emotional body related scenes as compared to non-emotional body related and neutral scenes did not differ for the eating disorder diagnostic groups

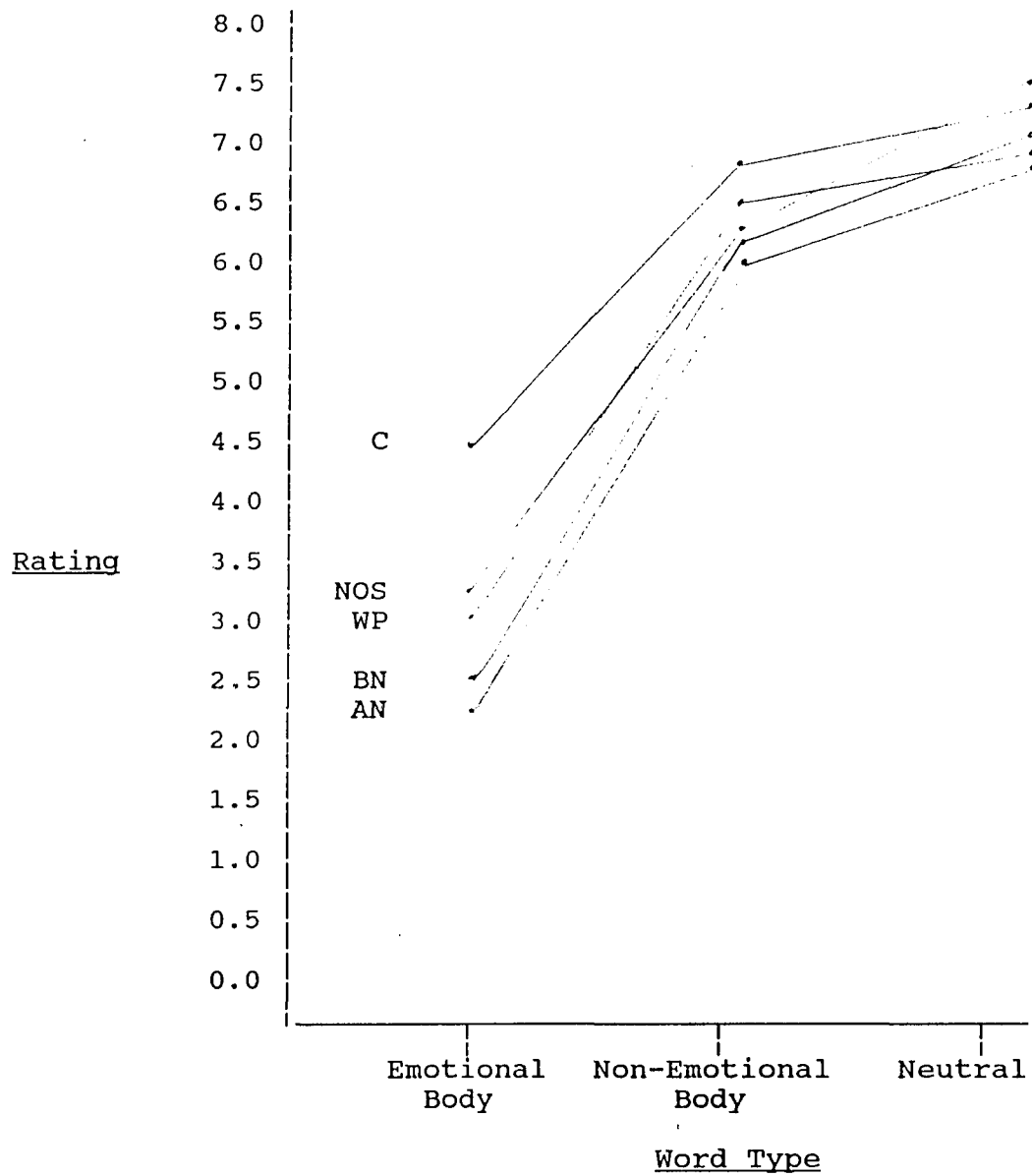


Table 9

Pleasantness Ratings: Means by Group

<u>Group</u>	<u>Word Type</u>		
	<u>Emotional</u> <u>Body Related</u>	<u>Non-Emotional</u> <u>Body Related</u>	<u>Neutral</u>
Anorexia Nervosa	2.46 (1.22) <sup>a</sup>	6.01 (1.73) <sup>b</sup>	6.97 (1.37) <sup>b</sup>
Bulimia Nervosa	2.51 (.88) <sup>a</sup>	6.47 (1.77) <sup>b</sup>	6.73 (.93) <sup>b</sup>
ED NOS	3.11 (2.33) <sup>a</sup>	6.21 (.78) <sup>b</sup>	6.84 (.85) <sup>b</sup>
Weight Preoccupied	3.01 (1.16) <sup>a</sup>	6.34 (1.35) <sup>b</sup>	7.57 (1.01) <sup>b</sup>
Control	4.44 (1.76) <sup>b</sup>	6.88 (1.59) <sup>b</sup>	7.49 (1.62) <sup>b</sup>
<hr/>			
Eating Disorder	2.69 (1.57) <sup>b</sup>	6.23 (1.46) <sup>c</sup>	6.85 (1.04) <sup>c</sup>
Non-ED	3.73 (1.66) <sup>a</sup>	6.61 (1.59) <sup>c</sup>	7.53 (1.48) <sup>c</sup>

Note. Means are followed by standard deviations in parentheses; ED= Eating Disorder; NOS= not otherwise specified; Superscripts which differ indicate that the means differ significantly.



Note. WP= Weight Preoccupied; C= Control;  
 NOS= Eating Disorder Not Otherwise  
 Specified; AN= Anorexia Nervosa; BN=  
 Bulimia Nervosa.

Figure 6

Pleasantness Rating Data

as compared to the non-eating disorder groups ( $F(4,85)=1.86$ ,  $p=.13$ ), and ratings of non-emotional body related scenes as compared to neutral words did not differ for the eating disorder diagnostic groups as compared to the non-eating disorder groups ( $F(4,85)=2.01$ ,  $p=.10$ ).

## Discussion

This investigation evaluated the presence of an explicit memory bias for emotional body related stimuli in eating disordered and weight preoccupied subjects. The eating disordered and weight preoccupied groups had equivalent scores on a measure of weight preoccupation (BSQ). The eating disorder group as compared to the weight preoccupied group reported more eating disorder symptomatology, but were equivalent on measures of depression and neuroticism. Therefore, clinical features of an eating disorder were the primary differences in psychopathology between the eating disordered and weight preoccupied subjects.

An explicit memory bias for emotional body related stimuli was found in the eating disorder subjects. As predicted, an explicit memory bias was evidenced only for body related words associated with negative emotionality. No explicit memory bias existed for non-emotional body related or neutral words. The data suggest that emotionality of stimuli may play a mediating role in explicit memory bias for stimuli related to a person's pathological concerns, i.e., body related stimuli for eating disorder subjects.

Comparisons of eating disorder diagnostic groups to non-eating disordered weight preoccupied and control groups showed that the recall patterns for the eating

disordered groups differed from the recall patterns for the non-eating disordered groups. Recall patterns within the eating disorder groups and the non-eating disordered groups did not differ. A greater number of emotional body related words as compared to non-emotional body and neutral words was recalled by each of the eating disordered groups. None of the groups differed on recall of non-emotional body related words as compared to neutral words. These findings indicate that the eating disordered groups had a bias for greater recall of emotional body related material, but not other types of words.

#### Weight Preoccupation and Memory Bias

Mean recall patterns indicated that as eating disorder symptom severity increased, memory bias for emotional body related words increased. For example, the anorexia nervosa patients, who are generally considered to be most disturbed, had a higher recall for emotional body related words than the bulimia nervosa patients. The bulimia nervosa patients, who might be regarded as having the second greatest disturbance, recalled more emotional body related words than the eating disorder not otherwise specified patients. The increasing memory bias found in eating disordered patients suggests that this recall bias may be symptomatic of extensively developed associative networks related to body concerns in anorexia and bulimia nervosa patients.

Weight preoccupied non-eating disordered subjects did not show evidence for an explicit memory bias for emotional body related words. These data argue that preoccupation with weight may not be the critical variable in determining memory bias. Instead a variable particular to the clinical condition itself may be of greater importance. It is recommended that future investigations examine the relationship between particular aspects of the clinical condition and memory bias.

The present study included a group of weight preoccupied women (BSQ  $\bar{M}$ =134.30) and a group of controls with average levels of weight preoccupation (BSQ  $\bar{M}$ =67.67). Baker (1993) compared women with extremely low levels of weight preoccupation (BSQ  $\bar{M}$ =45.00) and highly weight preoccupied women (BSQ  $\bar{M}$ =128.00) in a study of recall bias. In contrast to the findings of the present study, Baker found a memory bias for negative body related words in high weight preoccupied women as compared to extremely low weight preoccupied women. The present study did not find an explicit memory bias for emotional body related words in high weight preoccupied women as compared to women with an average level of weight preoccupation. Differences in the findings of the two studies is likely due to the definition of the control groups. The control group of the present study included a group of women who had an average level of weight preoccupation as compared

to Baker's group of low weight preoccupied women. The data from both studies taken together suggest that women with a low level of weight preoccupation do not have a memory bias for body related material. Non-eating disordered women with average or high levels of weight preoccupation have a moderate memory bias for body related words. Whereas, women with a high level of weight preoccupation who also have an eating disorder demonstrate an even stronger memory bias for body related information. Therefore, despite the finding that the weight preoccupied group in the present study did not show a memory bias for body related words, it cannot be concluded weight preoccupation plays no role in memory bias for body related information. An alternative explanation, given the findings of Baker (1993), is that weight preoccupation may be one of several psychopathological variables which determine the memory bias observed in this study for eating disorder subjects.

Following the finding of an explicit memory bias in eating disordered subjects, results of correlation analyses between measures of eating disorder symptomatology and weight preoccupation, and memory bias indicated a positive relationship between eating disorder symptomatology, weight preoccupation, and memory bias for emotional body related words across groups. Since the eating disorder group scored high on measures of eating

disorder symptomatology (EAT, BULIT) and also recalled a greater number of emotional body related words than non-emotional body-related and neutral words, it is not surprising that the memory bias for emotional body related words was positively correlated with the measures of eating disorder symptomatology. Therefore, these correlational findings are entirely consistent with data pertaining to group differences in the recall of body related stimuli and, thus, do not clarify information obtained from group effects.

#### Memory Intrusions

In accordance with the theories of Bower (1981) and Mandler (1980), the present investigation predicted that individuals concerned with body shape and weight would have extensively developed memory associations for body related words and, thus, would have more memory cues to assist in retrieval of such words during the free recall memory test. Also, it was predicted that elaborated associated networks for body related material would result in body related intrusions (or errors) in recalling body related information. Although eating disordered subjects demonstrated an explicit memory bias for emotional body related words, the eating disorder group did not have a greater number of body related intrusions relative to the control group. This finding suggests that the memory bias found in this study was not due to a simple response bias



for emotional body related material. In other words, eating disordered subjects did not just "guess" more frequently on the free recall task with emotional body related words than other word types. Therefore, it can be argued that the explicit memory bias occurred due to the strategies used in processing of information and not due to a response bias.

In addition, the eating disorder group had fewer intrusions for neutral words than the non-eating disorder groups. According to Beck's theory, intrusions of a particular type indicate the type of schema which has been activated. For example, if subjects had a high number of emotional body related intrusions, then the emotional body related schema was activated. Data from the present study do not support predictions from Beck's theory. The eating disorder group did not have a high number of body related intrusions, but had fewer neutral intrusions than the non-eating disorder groups. The data suggest that the schema for neutral information was less highly elaborated in eating disorder subjects than in non-eating disorder subjects. One interpretation might be that neutral information is more easily elicited in non-eating disordered persons than in eating disordered individuals.

### Depression and Neuroticism as Mediating Variables for Memory Bias

It is important to note that the explicit memory bias found in the present study diminished when variance due to depression was held constant. One interpretation might be that the explicit memory bias was due to depression in the eating disorder group. However, the eating disorder group did not differ from weight preoccupied group on measures of depression, neuroticism, and subjective distress (BDI, EPQ-N, and SUDS; see Table 3), and no memory bias was found in the weight preoccupied group. Thus, the data are not supportive of the interpretation that the explicit memory bias found in the present study was due to depression or neuroticism in the eating disorder group since an equivalent level of depression and neuroticism was found in the weight preoccupied group. The eating disorder and weight preoccupied groups differed on the degree of clinical eating disorder symptomatology (e.g., emaciation, binge eating, purgative behavior) in the eating disorder group. Thus, the explicit memory bias was most likely determined by some features of clinical eating disorder symptomatology. This variable may not have been adequately measured in the present investigation.

### Response Time to Imagine Scenes

In the encoding task, groups did not differ in response latency to imagine a scene involving themselves

and the presented word. The hypothesized presence of response latency differences was not considered crucial to the purpose of this study. Since groups did not significantly differ on encoding time for each word type, the free recall memory bias for emotional body related words evidenced by eating disorder subjects can be interpreted as due to a biased retrieval strategy rather than a difference in processing time at encoding.

#### Ratings of Word Pleasantness

The eating disorder and weight preoccupied subjects rated their imagery of emotional body related words as significantly more unpleasant than the ratings of the control group. The eating disorder group did not differ from the weight preoccupied group in pleasantness ratings of emotional body related scenes. Groups did not differ on pleasantness ratings of non-emotional body imagery or neutral imagery. In general, the explicit memory bias found in the present study is reflected in the pleasantness ratings of the three types of imagery. The eating disorder group demonstrated an explicit memory bias for emotional body related imagery and also rated emotional body related imagery as less pleasant than the non-eating disordered group. All groups rated emotional body related scenes as less pleasant than non-emotional body related and neutral scenes. On the other hand, groups did not demonstrate an explicit memory bias for

non-emotional body related scenes or neutral scenes and these scenes were rated as more pleasant than emotional body related scenes by all groups. Thus, experiencing the imagery as evoking more negative emotionality was insufficient by itself to produce memory bias in the non-eating disordered groups. The emotional salience of one's pathological concerns influences the perception of pleasantness for imagery related to that concern, however.

#### Future Research Considerations

Attentional bias was not investigated in the present study. Clinical observation suggests that eating disordered individuals may automatically shift attention toward body related stimuli. Some have suggested that attentional shift may increase preoccupation with body size, fear of fatness, and body image disturbance. For example, the Stroop interference effect for body related stimuli has been demonstrated in eating disorder patients (Cooper, Anastasiades, & Fairburn, 1992; Fairburn, Cooper, Cooper, Anastasiades, & McKenna, 1991; Ben-Tovim, Walker, Fok, & Yap, 1989; Channon, Hemsley, & de Silva, 1988). However, the stage of information processing at which interference occurs has yet to be determined. Considering the similarities evidenced between eating disorder subjects and depressed subjects on explicit memory tasks, it is likely that eating disordered subjects may not have an attentional bias but may be distracted by body related

stimuli. It may be that distraction coupled with cognitive elaboration (rehearsal) results in increased recall of emotional body related stimuli. It is suggested that future investigations empirically test this hypothesis.

The present investigation did not examine implicit memory bias. Implicit memory has been defined as recollection of stimuli previously presented without conscious awareness of recalling the stimuli from a previous task. Presented material becomes "primed" and becomes more readily recalled in tests of implicit memory. Implicit memory is considered to be an "automatic" process. Whereas, explicit memory requires "effortful" processing. Roediger (1990) recently reviewed investigations of implicit memory and concluded that although implicit and explicit memory are parallel processes which interact simultaneously, separation of implicit and explicit memory can occur with the proper methodology. Past research has demonstrated that anorexia nervosa patients perform more poorly than controls on implicit memory tasks involving stimuli unrelated to eating disorder psychopathology (Strupp, Weingartner, Kaye, & Gwirtsman, 1986). Future research could further investigate cognitive processes in eating disorders by priming activation of concern related schemata and, subsequently, testing for implicit memory biases. If an

implicit memory bias for body related stimuli was found in eating disordered patients, those findings would suggest that the processing of this information may be relatively automatic and non-effortful. These results would correspond to clinical observations of thought processes in eating disorder patients.

#### Theoretical Implications

Results of the present study can be interpreted using Beck's (1967) cognitive model of emotional disorders. Beck proposed that individuals have general units of knowledge, or "schema," that determine which aspects of a situation are most important and which information will be stored in memory. More specifically, individuals have self-schema which represent self-perception and influence behavior. Vitousek and Hollon (1990) suggested that self-schema and weight-related schema are central to the development and maintenance of eating disorder psychopathology. In the present study, the eating disorder group demonstrated an explicit memory bias for emotional body related words following encoding via a self-referenced encoding task. According to Beck's theory, this finding suggests that persons with an eating disorder have activated weight-related self-schema which facilitates encoding, processing, and retrieval of self-referenced body related material.

According to Bower's (1981) associative network model of memory, memories are associated in an hierarchical fashion. Thus, memories similar to one another in meaning are more closely linked than memories of unrelated events. Bower's spreading activation model of memory postulates that the memory network is composed of emotion nodes that are linked to memories of events which elicited that particular emotion. When an emotion node is activated, the activation radiates to memories which are linked to the emotion. The finding of a memory bias for emotional body related words and not non-emotional body related or neutral words is in support of Bower's theory. Words which activated an emotion node and the memories associated with the node were more readily recalled than words which failed to activate an emotion node (e.g., non-emotional body and neutral words).

Furthermore, Mandler's (1980) model of memory proposes that explicit memory involves an elaboration process in which the presented word is associated with other information in memory. Words which are more extensively elaborated are more readily retrieved due to increased associations which serve as retrieval cues. Beck's theory would suggest that body related schema are stronger and more extensively developed in eating disorder patients and, thus, are more easily activated. Both the theories of Beck and Bower suggest that information

related to the specific psychopathology of the individual is strengthened in the cognitive system and, thus, is more readily accessible for conscious recall.

Results of the present study are in support of Beck's (1967; 1972) notion of content specificity in neurotic disorders. Beck proposed that depressive schemata are specific to concerns related to the clinical nature of depression (e.g., negative thoughts about the self, world, and future). An interpretation of the present findings according to Beck's theory is that the schemata of eating disordered individuals are specific to the concerns of an eating disorder population (e.g., overconcern with body shape and weight, and fear of fatness). Thus, Beck's theory not only describes the memory system of depressed individuals, but also can be successfully applied to the memory bias for content specific material evidenced in eating disorder patients.

Beck's theory would predict that emotional body related material would be more easily activated in eating disordered persons than in non-eating disordered individuals. The data of the present study does not support this interpretation. Present findings suggest that emotional body related information may not be more easily activated in eating disordered persons, but when activated, emotional body related information is subjected to elaboration. The primary finding of explicit memory



bias in eating disordered subjects can be interpreted as due to the operation of elaborative processes.

Mandler's (1980) framework defines explicit memory as information that is directly accessible to conscious awareness. Encoding of stimuli may be influenced by the process of elaboration. Mandler suggests that elaboration is the primary process involved in explicit memory processes. Elaboration is conceptualized as a control process which determines how information forms associative links in memory. A more elaborated word develops increased associations in memory. Extensive associations (which increase when stimuli is self-referenced) result in the formation of more retrieval cues which increase information accessibility. Encoding tasks which encourage self-referencing (e.g., imagination of oneself in a scene) result in increased elaboration and depth of processing which improve retrieval in explicit memory.

The finding in this study of an explicit memory bias for emotional body related words in eating disorder subjects suggests that the processing of these words may have involved elaboration. If individuals with eating disorders elaborated on emotional body related words, these words would form more associations in memory than non-emotional body related and neutral word types. This interpretation suggests that emotional body related words

received more extensive cognitive processing than words of other valences and, thus, were more readily retrieved.

### Conclusions

The findings of the present investigation suggest that eating disordered individuals have an explicit memory bias for emotional body related words. In other words, when asked to recall information from a previous task, eating disordered individuals recalled self-referenced emotional body related information at a higher rate than two other groups. Weight preoccupied normals did not demonstrate an explicit memory bias for body related words. Since the eating disorder group and the weight preoccupied group were equated on degree of weight preoccupation, depression, anxiety, and neuroticism, explicit memory bias is likely due to a variable particular to the clinical condition itself rather than preoccupation with weight alone. Results suggest that severity of eating disorder symptomatology and weight preoccupation play a role in explicit memory bias for emotional body related words. Theoretical interpretations of this finding indicate that this memory bias may be conceptually driven and that the bias relies upon the process of elaboration.

Explicit memory bias may result in maintenance or worsening of symptomatology in eating disorder patients. Since the process of elaboration in explicit memory

renders emotional body related memories more accessible, retrieval of these memories becomes easier. Thus, a vicious cycle may develop in which encoding of body related material leads to the strengthening of body related schemata. The result is increased accessibility of body related material to retrieval and, subsequent, worsening of eating disorder symptomatology.

Explicit memory bias in eating disorder patients may influence the development and maintenance of cognitive variables pertinent to eating disordered psychopathology. The process of elaboration can effectively account for possible reasons why persons with eating disorders exhibit a memory bias for emotional body related subject matter. Implementation of cognitive modification strategies in the treatment eating disorder patients may serve to modify cognitive elaboration. Therefore, emotional body related information would be less likely to be retrieved and, subsequently, body related concerns would diminish. Recent evidence in support of cognitive therapy for treatment of eating disorders appears promising. Fairburn et al. (1991) found cognitive-behavioral therapy for bulimia nervosa to be superior to behavior therapy and interpersonal therapy. Cognitive approaches to eating disorder treatment could become increasingly effective if modified according to current and future research findings concerning memory processes in eating disorders.

Since no published studies to date have examined explicit memory biases in eating disorders, many opportunities exist for future investigations. It is suggested that future research examine attentional mechanisms and implicit memory processes in eating disorder patients. The presence of an implicit memory bias would suggest the cognitive processes of eating disorder patients are automatic (do not require effortful processing). Investigations should further examine encoding processes as well as retrieval strategies. Past research has found evidence for encoding biases in eating disorder patients. Interference for body related stimuli on the Stroop task (e.g., Cooper et al., 1992) and on dichotic listening tasks (Schotte et al., 1990) has been reported in bulimia nervosa patients. Evidence for retrieval biases include the finding of an explicit memory bias for emotional body related stimuli in the present study as well as similar findings in weight preoccupied women by Baker (1993).

Clinical observations indicate that obsessive thought processes are common in eating disordered individuals. Thus, it is recommended that there be further study of possible mediating factors, such as obsessional thought, which may enhance elaboration. Clinical variables such as length of illness, age of onset, and symptomatic exacerbations and remissions should also be examined as

factors which influence memory bias. Following further empirical study, explicit memory tests may potentially be useful as assessment and treatment outcome measures. This type of research may serve to improve clinical treatments for the eating disorders.

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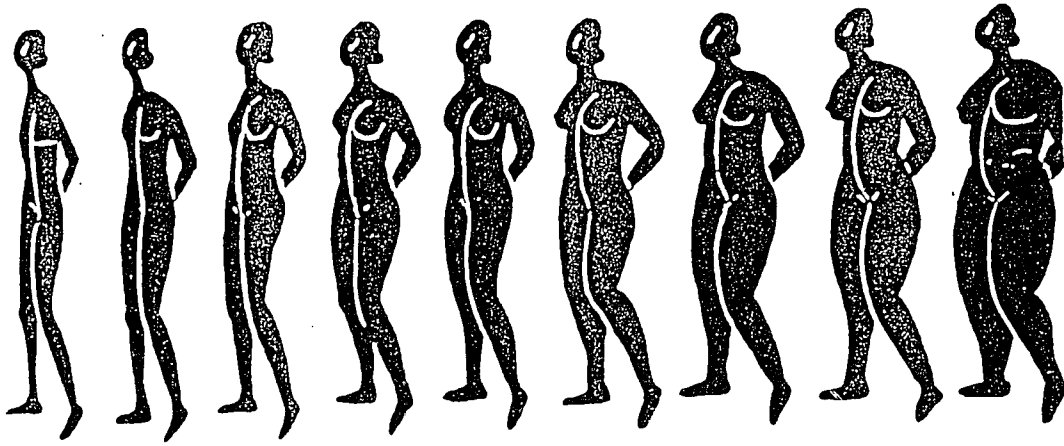
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Appendix A  
Body Image Assessment (BIA)



Body size silhouette for Body Image Assessment.

Appendix B  
Eating Attitudes Test (EAT)

D.M. Garner and P.E. Garfinke.  
"EAT"

Please circle the response which best applies to each of the numbered statements. Please answer each question carefully. Thank you.

- | Always | Very Often | Often | Sometimes | Rarely | Never |  |
|--------|------------|-------|-----------|--------|-------|--|
| 0      | 1          | 2     | 3         | 4      | 5     | 1. Like eating with other people.  |
| 0      | 1          | 2     | 3         | 4      | 5     | 2. Prepare foods for others but do not eat what I cook.  |
| 0      | 1          | 2     | 3         | 4      | 5     | 3. Become anxious prior to eating.   |
| 0      | 1          | 2     | 3         | 4      | 5     | 4. Am terrified about being overweight.  |
| 0      | 1          | 2     | 3         | 4      | 5     | 5. Avoid eating when I am hungry.  |
| 0      | 1          | 2     | 3         | 4      | 5     | 6. Find myself preoccupied with food.  |
| 0      | 1          | 2     | 3         | 4      | 5     | 7. Have gone on eating binges when I feel that I may not be able to stop.                        |
| 0      | 1          | 2     | 3         | 4      | 5     | 8. Cut my food into small pieces.  |
| 0      | 1          | 2     | 3         | 4      | 5     | 9. Aware of the calorie content of foods that I eat.   |
| 0      | 1          | 2     | 3         | 4      | 5     | 10. Particularly avoid foods with a high carbohydrate content (e.g. bread, potatoes, rice, etc.) |
| 0      | 1          | 2     | 3         | 4      | 5     | 11. Feel bloated after meals.  |
| 0      | 1          | 2     | 3         | 4      | 5     | 12. Feel that others would prefer if I ate more.   |
| 0      | 1          | 2     | 3         | 4      | 5     | 13. Vomit after I have eaten.  |
| 0      | 1          | 2     | 3         | 4      | 5     | 14. Feel extremely guilty after eating.  |
| 0      | 1          | 2     | 3         | 4      | 5     | 15. Am preoccupied with a desire to be thinner.  |
| 0      | 1          | 2     | 3         | 4      | 5     | 16. Exercise strenuously to burn off calories.   |
| 0      | 1          | 2     | 3         | 4      | 5     | 17. Weigh myself several time a day.   |
| 0      | 1          | 2     | 3         | 4      | 5     | 18. Like my clothes to fit tightly.  |

Always	Very Often	Often	Sometimes	Rarely	Never	
0	1	2	3	4	5	19. Enjoy eating meat.
0	1	2	3	4	5	20. Wake up early in the morning.
0	1	2	3	4	5	21. Eat the same foods day after day.
0	1	2	3	4	5	22. Think about burning up calories when I exercise.
0	1	2	3	4	5	23. Have regular menstrual periods.
0	1	2	3	4	5	24. Other people think I am too thin.
0	1	2	3	4	5	25. Am preoccupied by the thought of having fat on my body.
0	1	2	3	4	5	26. Take longer than others to eat my meals.
0	1	2	3	4	5	27. Enjoy eating at restaurants.
0	1	2	3	4	5	28. Take laxatives.
0	1	2	3	4	5	29. Avoid foods with sugar in them.
0	1	2	3	4	5	30. Eat diet foods.
0	1	2	3	4	5	31. Feel that food controls my life.
0	1	2	3	4	5	32. Display self control around food.
0	1	2	3	4	5	33. Feel that others pressure me to eat.
0	1	2	3	4	5	34. Give too much time and thought to food.
0	1	2	3	4	5	35. Suffer from constipation.
0	1	2	3	4	5	36. Feel uncomfortable after eating sweets.
0	1	2	3	4	5	37. Engage in dieting behavior.
0	1	2	3	4	5	38. Like my stomach to be empty.
0	1	2	3	4	5	39. Enjoy trying new rich foods.
0	1	2	3	4	5	40. Have the impulse to vomit after meals.

Appendix C  
Bulimia Test (BULIT)



Name: \_\_\_\_\_

Date: \_\_\_\_\_

## BULIT

Answer each question on the following pages by checking the appropriate number under each question. Please respond to each item as honestly as possible; remember, all of the information you provide will be kept strictly confidential.

1. Do you ever eat uncontrollably to the point of stuffing yourself (i.e., go on eating binges)?
  1. once a month or less
  2. 2-3 times a month
  3. once or twice a week
  4. 3-4 times a week
  5. once a day or more
2. I am satisfied with my eating patterns.
  1. agree
  2. neutral
  3. disagree a little
  4. disagree
  5. disagree strongly
3. Have you ever kept eating until you thought you'd exploded?
  1. practically every time I eat
  2. very frequently
  3. often
  4. sometimes
  5. seldom or never
4. Would you presently call yourself a "binge eater"?
  1. yes, absolutely
  2. yes
  3. yes, probably
  4. yes, possibly
  5. no, probably not
5. I prefer to eat:
  1. at home alone
  2. at home with others
  3. in a public restaurant
  4. at a friend's house
  5. doesn't matter
6. Do you feel you have control over the amount of food you consume?
  1. most or all of the time
  2. a lot of the time
  3. occasionally
  4. rarely
  5. never

7. I use laxatives or suppositories to help control my weight.
  1. once a day or more
  2. 3-6 times a week
  3. once or twice a week
  4. 2-3 times a month
  5. once a month or less
8. I eat until I feel too tired to continue.
  1. at least once a day
  2. 3-6 times a week
  3. once or twice a week
  4. 2-3 times a month
  5. once a month or less ( or never)
9. How often do you prefer eating ice cream, milk shakes, or puddings during a binge?
  1. always
  2. frequently
  3. sometimes
  4. seldom or never
  5. I don't binge
10. How much are you concerned about your eating binges?
  1. I don't binge
  2. bothers me a little
  3. moderate concern
  4. major concern
  5. probably the biggest concern in my life
11. Most people I know would be amazed if they knew how much food I can eat at one sitting.
  1. without a doubt
  2. very probably
  3. probably
  4. possibly
  5. no
12. Do you ever eat to the point of feeling sick?
  1. very frequently
  2. frequently
  3. fairly often
  4. occasionally
  5. rarely or never
13. I am afraid to eat anything for fear that I won't be able to stop.
  1. always
  2. almost always
  3. frequently
  4. sometimes
  5. seldom or never

14. I don't like myself after I eat too much.
  1. always
  2. frequently
  3. sometimes
  4. seldom or never
  5. I don't eat too much
15. How often do you intentionally vomit after eating?
  1. 2 or more times a week
  2. once a week
  3. 2-3 times a month
  4. once a month
  5. less than once a month or never
16. Which of the following describes your feelings after binge eating?
  1. I don't binge eat
  2. I feel O.K.
  3. I feel mildly upset with myself
  4. I feel quite upset with myself
  5. I hate myself
17. I eat a lot of food when I'm not even hungry.
  1. very frequently
  2. frequently
  3. occasionally
  4. sometimes
  5. seldom or never
18. My eating patterns are different from eating patterns of most people.
  1. always
  2. almost always
  3. frequently
  4. sometimes
  5. seldom or never
19. I have tried to lose weight by fasting or going on "crash" diets.
  1. not in the past year
  2. once in the past year
  3. 2-3 times in the past year
  4. 4-5 times in the past year
  5. more than 5 times in the past year
20. I feel sad or blue after eating more than I'd planned to eat.
  1. always
  2. almost always
  3. frequently
  4. sometimes
  5. seldom, never, or not applicable

21. When engaged in an eating binge, I tend to eat foods that are high in carbohydrates (sweets and starches).
1. always
  2. almost always
  3. frequently
  4. sometimes
  5. seldom, or I don't binge
22. Compared to most people, my ability to control my eating behavior seems to be:
1. greater than others' ability
  2. about the same
  3. less
  4. much less
  5. I have absolutely no control
23. One of your best friends suddenly suggests that you both eat at a new restaurant buffet that night. Although you'd planned on eating something light at home, you go ahead and eat out, eating quite a lot and feeling uncomfortably full. How would you feel about yourself on the ride home?
1. fine, glad I'd tried that new restaurant
  2. a little regretful that I'd eaten so much
  3. somewhat disappointed in myself
  4. upset with myself
  5. totally disgusted with myself
24. I would presently label myself a "compulsive eater", (one who engages in episodes of uncontrolled eating).
1. yes
  2. yes, probably
  3. yes, possibly
  4. yes, possibly
  5. no, probably not
25. What is the most weight you've ever lost in one month?
1. over 20 pounds
  2. 12-20 pounds
  3. 8-11 pounds
  4. 4-7 pounds
  5. less than 4 pounds
26. If I eat too much at night I feel depressed the next morning.
1. always
  2. frequently
  3. sometimes
  4. seldom or never
  5. I don't eat too much at night
27. Do you believe that it is easier for you to vomit than it is for most?
1. yes, it's no problem at all for me
  2. yes, it's easier
  3. yes, it's a little easier
  4. about the same
  5. no, it's less easy

28. I feel that food controls my life.
1. always
  2. almost always
  3. frequently
  4. sometimes
  5. seldom or never
29. I feel depressed immediately after I eat too much.
1. always
  2. frequently
  3. sometimes
  4. seldom or never
  5. I don't eat too much.
30. How often do you vomit after eating in order to lose weight?
1. less than once a month or never
  2. once a month
  3. 2-3 times a month
  4. once a week
  5. 2 or more times a week
31. When consuming a large quantity of food, at what rate of speed do you usually eat?
1. more rapidly than most people have ever eaten in their lives
  2. a lot more rapidly than most people
  3. a little more rapidly than most people
  4. about the same rate as most people
  5. more slowly than most people (or not applicable)
32. What is the most weight you have ever gained in one month?
1. over 20 pounds
  2. 12-20 pounds
  3. 8-11 pounds
  4. 4-7 pounds
  5. less than 4 pounds
33. My last menstrual period was:
1. within the past month
  2. within the past 2 months
  3. within the past 4 months
  4. within the past 6 months
  5. not within the past 6 months
34. I use diuretics (water pills) to help control my weight:
1. once a day or more
  2. 3-6 times a week
  3. once or twice a week
  4. 2-3 times a month
  5. once a month or less (or never)
35. How do you think your appetite compares with that of most people you know?
1. many times larger than most
  2. much larger
  3. a little larger
  4. about the same
  5. smaller than most

## Appendix D

### Interview for the Diagnosis of Eating Disorders (IDED)

:

## INTERVIEW FOR DIAGNOSIS OF EATING DISORDERS (IDED)

DATE \_\_\_\_\_

NAME \_\_\_\_\_ AGE \_\_\_\_\_ RACE \_\_\_\_\_

DATE OF BIRTH \_\_\_\_\_ WEIGHT \_\_\_\_\_ HEIGHT \_\_\_\_\_

ADDRESS \_\_\_\_\_

TELEPHONE \_\_\_\_\_ REFERRED BY \_\_\_\_\_

I. General Assessment and History

1. What types of problems do you have with eating or weight-related matters? How long has this been a problem?
2. What has been your highest and lowest weight? When?
3. Were you overweight as a child? Y N (Describe.)
4. Were you/are you overweight as an adolescent? Y N (Describe.)
5. What has been the course of your eating problems? (How the behavior began, increases, decreases, changes in eating.)

6. Have you had any medical/dental problems? (Check for dizziness, LBP, HBP, tooth erosion, thyroid problems, diabetes.)

7. Do you avoid eating certain foods? Y N (Describe.)

What emotional reaction occurs when you eat these "forbidden" foods? (Foods which are avoided or purged due to a belief that the foods will lead to rapid and significant weight gain.)

8. How many members are there in your household?

Do they know about your eating problems? Y N  
If yes, how do they react/feel about your eating disorder?

Would they participate in your treatment?

## II. Anorexia Nervosa

1. Do you currently go periods of time without eating (starvation) to control your weight? Y N (If Y, describe.)



When did you first begin to lose weight/restrict your eating?

Are there any factors/situations which seem to increase or decrease periods of restrictive eating?

2. Do you feel that your weight is normal?  
Y N (Describe.)

3. What emotional reaction would you have if you lost  
2 lbs.?  
5 lbs.?  
10 lbs.?

What emotional reaction would you have if you gained  
2 lbs.?  
5 lbs.?  
10 lbs.?

4. Do you wish to be thinner than you are now? Y N  
(If Y, ask what body areas should be thinner.)

What is your goal weight?

Do you think or worry a lot about your weight and body size?

Do you often feel "fat" when you gain only a few pounds?  
Y N (Describe.)

Do you weigh yourself often? Y N How often?

5. When was your last menstrual cycle?

Have you experienced menstrual irregularities within the last three months? Y N (Describe.)

### III. Bulimia Nervosa

1. Do you ever binge (rapid consumption of large amounts of food in a discrete period of time?) What is the daily course of your binge eating? (Describe all covert and overt events that usually occur prior to, during, and after a binge.)

Do you ever feel as though you have overeaten when you eat small portions of certain fattening foods? Y N (Describe.)

When did you first begin to have problems with binge?

Are there any factors which appear to increase or decrease the frequency of binge eating?

2. Do you feel out of control prior to or during a binge?  
Y N (Describe.) Do you feel hungry prior to a binge? Y N

3. Do you purge after meals or after a binge? Y N

Do you vomit? Y N How often per day/week?

Do you use laxatives? Y N How often, what type?

Do you use diuretics? Y N How often, what type?

Do you use appetite suppressants? Y N How often, type?

Do you often go on strict diets? Y N How often, type?

Do you engage in vigorous exercise? Y N How often, type?

When did you first begin to purge?

Are there any factors which appear to increase or decrease the frequency of purging?

4. How often does the binge eating occur?

How long have you been bingeing at least twice per week?

How often does the binge-purge cycle occur?

IV. Compulsive Overeating

1. If you binge, what types of food do you typically eat?
2. Do you binge alone, or in secret? Y N (Describe.)
3. What emotions typically precede a binge?
4. Do you often attempt to diet in order to lose weight?  
(Describe.)
5. Have you had frequent weight fluctuations greater than  
ten pounds in the past few years? Y N (Describe.)
6. Do you consider your eating to be abnormal? Y N  
Do you feel that you have control over your eating? Y N

7. How do you feel during and after a binge episode?  
(Describe.)

8. Are you satisfied with your current weight? Y N

If no, what is your goal weight?

## Rating Scale for the IDED

1. Anorexia Nervosa

## 1. Refusal to maintain appropriate weight for height

1	2	3	4	5	6	7
Accepts normal wt.	Prefers 5% below normal wt.	Prefers 10% below normal wt.	Prefers 15% below normal wt.	Prefers 20% below normal wt.	Prefers 25% below normal wt.	Prefers > 25% below normal wt.

## 2. Intense fear of weight gain

1	2	3	4	5	6	7
No Fear	Minimal Fear	Minimal Fear	Moderate Fear	Strong Fear	Intense Fear	Morbid Fear

## 3. Body image disturbance: Feels "fat"

1	2	3	4	5	6	7
Never	Occasionally when "stuffed"	After eating meals	After eating small amounts of food	Most of the time	Almost all of the time	All of the time

## 4. Amenorrhea

1	2	3	4	5	6	7
Very Regular	Slight Irregularity	Missed 2 cycles last 6 mos.	Missed 3 cycles last 6 mos.	Missed 4 cycles last 6 mos.	Missed 5 cycles last 6 mos.	Missed 6 cycles last 6 mos.

## II. Bulimia Nervosa

### 1. Recurrent binge eating episodes

1	2	3	4	5	6	7
Never	Infrequent	Infrequent	Frequent	Frequent	Very	Very
binges	and small	but large	and	including	frequent	frequent
			large	binges	w/ only	w/
				and	large	binges +
				Forbidden	binges	forbid.
				foods		foods

### 2. Feeling of loss of control during binge eating

1	2	3	4	5	6	7
Always	Rare	Occa-	Frequent	Usually	Almost	Never
in	loss	sional	loss of	out of	always	in
control	of	loss	control	control	out of	control
	control	of			control	
		control				

### 3. Purgative behavior

1	2	3	4	5	6	7
None	Purges	Purges	Purges	Purges	Purges	Purges
	1-2/	1 time/	1-3	1-2	3-6	1 or more
	year	3 mos.	times/	times/	times/	times/
			mo.	week	week	day

### 4. Frequency of binge eating

1	2	3	4	5	6	7
Rarely	Occurs	1-4	5-8	2-3	4-6	Occurs
occurs	a few	times/	times/	times/	times/	daily
	times/	month	month	week	week	or almost
	year					daily

## 5. Overconcern with body shape and size

1	2	3	4	5	6	7
No over-concern	Minimal concern	Some preoccupation	Moderate degree of pre-occupation	Preoccupied most of the time	Preoccupied almost all of the time	Preoccupied all of the time

Compulsive Overeating

## 1. Recurrent binge eating episodes

1	2	3	4	5	6	7
Never Binges	Infrequent and small	Infrequent but large	Frequent and large	Frequent including binges + forbidden foods	Very frequent w/ only large binges	Very frequent w/ binges + forbid. foods

## 2. Consumption of high-calorie, easily ingested food during a binge

1	2	3	4	5	6	7
No binges	Minimal Overeat of normal foods	Moderate Overeat of normal foods	Binges on normal foods	Binges on normal and hi-cal foods	Binges exclusively on hi-cal foods	Overeats at meals and binges only hi-cal foods

## 3. Inconspicuous eating during a binge

1	2	3	4	5	6	7
No binges	Prefers to eat with friends or family	Overeats with friends or family	Binges with few people	Binges at home alone with others in house	Rarely binges with anyone else present	Binges only when alone



## 4. Repeated efforts at dieting

1	2	3	4	5	6	7
Never diets	Diets 1-2 times/ year	Diets 3-4 times/ year	Diets 5-6 times/ year	Diets every month	Diets almost every week	Diets all of the time

## 5. Negative affect prior to binge

1	2	3	4	5	6	7
No binges	Seldom over- eats due to - affect	Sometimes over- eats due to - affect	Often Binge eats due to extreme - affect	Freq. Binge eats due to moderate - affect	Usually Binge eats due to mild - affect	Almost always binge eats due to - affect

## 6. Frequent weight fluctuations greater than 10 lbs.

1	2	3	4	5	6	7
None	Minimal wt. fluc.	Few 1-9 lb. fluc.	Few 10 lb. fluc.	Many 10 lb. fluc.	Few 10-20 lb. fluc.	Many 10-20 lb. fluc.

## 7. Absence of purgative behaviors

1	2	3	4	5	6	7
Purges daily	Purges weekly	Purges monthly	Purges Infre- quently	Purges 1-2/ year	Diets occa- sionally	None

## 8. Realization that eating pattern is abnormal/out of control

1	2	3	4	5	6	7
No Px	Minimal Px	Occa- sional mild feelings	Fre- quent mild feelings	Fre- quent moderate feelings	Fre- quent intense feelings	Extremely frequent and intense

Appendix E  
Body Shape Questionnaire (BSQ)

We would like to know how you have been feeling about your appearance over the PAST FOUR WEEKS. Please read each question and circle the appropriate number to the right. Please answer all the questions.

OVER THE PAST FOUR WEEKS:	Never	Rarely	Some- times	Often	Very Often	Always
1. Has feeling bored made you brood about your shape?	1	2	3	4	5	6
2. Have you been so worried about your shape that you have been feeling that you ought to diet?	1	2	3	4	5	6
3. Have you thought that your thighs, hips, or bottom are too large for the rest of you?	1	2	3	4	5	6
4. Have you been afraid that you might become fat (or fatter)?	1	2	3	4	5	6
5. Have you worried about your flesh not being firm enough?	1	2	3	4	5	6
6. Has feeling full (e.g., after eating a large meal) made you feel fat?	1	2	3	4	5	6
7. Have you felt so bad about your shape that you have cried?	1	2	3	4	5	6
8. Have you avoided running because your flesh might wobble?	1	2	3	4	5	6
9. Has being with thin women made you feel self-conscious about your shape?	1	2	3	4	5	6
10. Have you worried about your thighs spreading out when sitting down?	1	2	3	4	5	6
11. Has eating even a small amount of food made you feel fat?	1	2	3	4	5	6
12. Have you noticed the shape of other women and felt that your own shape compared unfavorably?	1	2	3	4	5	6
13. Has thinking about your shape interfered with your ability to concentrate (e.g., while watching TV, reading, listening to conversations)?	1	2	3	4	5	6

## Page 2

	Never	Rarely	Some- times	Often	Very Often	Always
14. Has being naked, such as when taking a bath, made you feel fat?	1	2	3	4	5	6
15. Have you avoided wearing clothes which make you particularly aware of the shape of your body?	1	2	3	4	5	6
16. Have you imagined cutting off fleshy areas of your body?	1	2	3	4	5	6
17. Has eating sweets, cakes, or other high calorie food made you feel fat?	1	2	3	4	5	6
18. Have you not gone out to social occasions (e.g., parties) because you have felt bad about your shape?	1	2	3	4	5	6
19. Have you felt excessively large and rounded?	1	2	3	4	5	6
20. Have you felt ashamed of your body?	1	2	3	4	5	6
21. Has worry about your shape made you diet?	1	2	3	4	5	6
22. Have you felt happiest about your shape when your stomach has been empty (e.g., in the morning)?	1	2	3	4	5	6
23. Have you thought that you are the shape you are because you lack self-control?	1	2	3	4	5	6
24. Have you worried about other people seeing rolls of flesh around your waist or stomach?	1	2	3	4	5	6
25. Have you felt that it is not fair that other women are thinner than you?	1	2	3	4	5	6
26. Have you vomited in order to feel thinner?	1	2	3	4	5	6

Page 3

	Never	Rarely	Some- times	Often	Very Often	Always
27. When in company have you worried about taking up too much room (e.g., sitting on a sofa or bus seat)?	1	2	3	4	5	6
28. Have you worried about your flesh being dimply?	1	2	3	4	5	6
29. Has seeing your reflection (e.g., in a mirror or shop window) made you feel bad about your shape?	1	2	3	4	5	6
30. Have you pinched areas of your body to see how much fat is there?	1	2	3	4	5	6
31. Have you avoided situations where people could see your body (e.g., communal changing rooms or swimming pools)?	1	2	3	4	5	6
32. Have you taken laxatives in order to feel thinner?	1	2	3	4	5	6
33. Have you been particularly self-conscious about your shape when in the company of other people?	1	2	3	4	5	6
34. Has worry about your shape made you feel you ought to exercise?	1	2	3	4	5	6

Appendix F  
Beck Depression Inventory (BDI)

BECK INVENTORY

NAME: \_\_\_\_\_ CLIENT #: \_\_\_\_\_ DATE: \_\_\_\_\_ ADMINISTRATION #: \_\_\_\_\_

On this questionnaire are groups of statements. Please read each group of statements carefully. Then pick out the one statement in each group which best describes the way you have been feeling the PAST WEEK, INCLUDING TODAY! Circle the number beside the statement you picked. If several statements in the same group seem to apply equally well to you, circle each one. Be sure to read all the statements in each group before making your choice.

1.   0 I do not feel sad.  
     1 I feel sad.  
     2 I am sad all the time and I can't snap out of it.  
     3 I am so sad or unhappy that I can't stand it.
2.   0 I am not particularly discouraged about the future.  
     1 I feel discouraged about the future.  
     2 I feel I have nothing to look forward to.  
     3 I feel that the future is hopeless and that things cannot improve.
3.   0 I do not feel like a failure.  
     1 I feel I have failed more than the average person.  
     2 As I look back on my life, all I can see is a lot of failure.  
     3 I feel I am a complete failure as a person.
4.   0 I get as much satisfaction out of things as I used to.  
     1 I don't enjoy things the way I used to.  
     2 I don't get real satisfaction out of anything anymore.  
     3 I am dissatisfied or bored with everything.
5.   0 I don't feel particularly guilty.  
     1 I feel guilty a good part of the time.  
     2 I feel quite guilty most of the time.  
     3 I feel guilty all of the time.
6.   0 I don't feel I am being punished.  
     1 I feel I may be punished.  
     2 I expect to be punished.  
     3 I feel I am being punished.
7.   0 I don't feel disappointed in myself.  
     1 I am disappointed in myself.  
     2 I am disgusted with myself.  
     3 I hate myself.
8.   0 I don't feel I am worse than anybody else.  
     1 I am critical of myself for my weaknesses or mistakes.  
     2 I blame myself all the time for my faults.  
     3 I blame myself for everything bad that happens.
9.   0 I don't have any thoughts of killing myself.  
     1 I have thoughts of killing myself, but I would not carry them out.  
     2 I would like to kill myself.  
     3 I would kill myself if I had the chance.
10.   0 I don't cry anymore than usual.  
     1 I cry more than I used to.  
     2 I cry all the time now.  
     3 I used to be able to cry, now I can't cry even though I want to.

CONTINUED ON BACK OF PAGE

11. 0 I am no more irritated now than I ever am.  
 1 I get annoyed or irritated more easily than I used to.  
 2 I feel irritated all the time now.  
 3 I don't get irritated at all by the things that used to irritate me.
12. 0 I have not lost interest in other people.  
 1 I am less interested in other people than I used to be.  
 2 I have lost most of my interest in other people.  
 3 I have lost all of my interest in other people.
13. 0 I make decisions about as well as I ever could.  
 1 I put off making decisions more than I used to.  
 2 I have greater difficulty in making decisions than before.  
 3 I can't make decisions at all anymore.
14. 0 I don't feel I look any worse than I used to.  
 1 I am worried that I am looking old or unattractive.  
 2 I feel that there are permanent changes in my appearance that make me look unattractive.  
 3 I believe that I look ugly.
15. 0 I can work about as well as before.  
 1 It takes an extra effort to get started at doing something.  
 2 I have to push myself very hard to do anything.  
 3 I can't do any work at all.
16. 0 I can sleep as well as usual.  
 1 I don't sleep as well as I used to.  
 2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.  
 3 I wake up several hours earlier than I used to and cannot get back to sleep.
17. 0 I don't get more tired than usual.  
 1 I get tired more easily than I used to.  
 2 I get tired from doing almost anything.  
 3 I am too tired to do anything.
18. 0 My appetite is no worse than usual.  
 1 My appetite is not as good as it used to be.  
 2 My appetite is much worse now.  
 3 I have no appetite at all anymore.
19. 0 I haven't lost much weight, if any lately.  
 1 I have lost more than 5 pounds.  
 2 I have lost more than 10 pounds.  
 3 I have lost more than 15 pounds.  

I am purposely trying to lose weight by eating less.  
 Yes \_\_\_\_\_ No \_\_\_\_\_
20. 0 I am no more worried about my health than usual.  
 1 I am worried about physical problems such as aches and pains; or upset stomach; or constipation.  
 2 I am very worried about physical problems and it's hard to think of much else.  
 3 I am so worried about my physical problems, that I cannot think about anything else.
21. 0 I have not noticed any recent change in my interest in sex.  
 1 I am less interested in sex than I used to be.  
 2 I am much less interested in sex now.  
 3 I have lost interest in sex completely.



Appendix G  
Visual Analogue Scale (VAS)

Subject # \_\_\_\_\_

Please rate your present anxiety or discomfort on the scale below by circling the appropriate number.

No Anxiety	Minor Anxiety	Moderate Anxiety	High Anxiety	Extreme Anxiety
1 -----	2 -----	3 -----	4 -----	5 -----

Appendix H

Subjective Units of Distress Scale (SUDS)

Subject # \_\_\_\_\_

On the scale below, please indicate how sad or depressed you are feeling right now, by circling the appropriate number.

Normal	Slightly	Moderately	Very	Extremely
Mood	Depressed	Depressed	Depressed	Depressed

1 ----- 2 ----- 3 ----- 4 ----- 5

Appendix I  
Eysenck Personality Questionnaire (EPQ)

## IN EVERY QUESTION, MARK JUST ONE BOX

1. Do you have many different hobbies? YES ☐ NO ☐
2. Do you stop to think things over before doing anything? YES ☐ NO ☐
3. Does your mood often go up and down? YES ☐ NO ☐
4. Have you ever taken the praise for something you knew someone else had really done? YES ☐ NO ☐
5. Are you a talkative person? YES ☐ NO ☐
6. Would being in debt worry you? YES ☐ NO ☐
7. Do you ever feel "just miserable" for no reason? YES ☐ NO ☐
8. Were you ever greedy by helping yourself to more than your share of anything? YES ☐ NO ☐
9. Do you lock up your house carefully at night? YES ☐ NO ☐
10. Are you rather lively? YES ☐ NO ☐
11. Would it upset you a lot to see a child or an animal suffer? YES ☐ NO ☐
12. Do you often worry about things you should not have done or said? YES ☐ NO ☐
13. If you say you will do something, do you always keep your promise no matter how inconvenient it might be? YES ☐ NO ☐
14. Can you usually let yourself go and enjoy yourself at a lively party? YES ☐ NO ☐
15. Are you an irritable person? YES ☐ NO ☐
16. Have you ever blamed someone for doing something you knew was really your fault? YES ☐ NO ☐
17. Do you enjoy meeting new people? YES ☐ NO ☐
18. Do you believe insurance plans are a good idea? YES ☐ NO ☐
19. Are your feelings easily hurt? YES ☐ NO ☐
20. Are all your habits good and desirable ones? YES ☐ NO ☐
21. Do you tend to keep in the background on social occasions? YES ☐ NO ☐
22. Would you take drugs which may have strange or dangerous effects? YES ☐ NO ☐
23. Do you often feel "fed-up"? YES ☐ NO ☐
24. Have you ever taken anything (even a pin or button) that belonged to someone else? YES ☐ NO ☐
25. Do you like going out a lot? YES ☐ NO ☐
26. Do you enjoy hurting people you love? YES ☐ NO ☐
27. Are you often troubled about feelings of guilt? YES ☐ NO ☐
28. Do you sometimes talk about things you know nothing about? YES ☐ NO ☐
29. Do you prefer reading to meeting people? YES ☐ NO ☐
30. Do you have enemies who want to harm you? YES ☐ NO ☐
31. Would you call yourself a nervous person? YES ☐ NO ☐
32. Do you have many friends? YES ☐ NO ☐
33. Do you enjoy practical jokes that can sometimes really hurt people? YES ☐ NO ☐
34. Are you a worrier? YES ☐ NO ☐
35. As a child did you do as you were told immediately and without grumbling? YES ☐ NO ☐
36. Would you call yourself happy-go-lucky? YES ☐ NO ☐
37. Do good manners and cleanliness matter much to you? YES ☐ NO ☐
38. Do you worry about awful things that might happen? YES ☐ NO ☐
39. Have you ever broken or lost something belonging to someone else? YES ☐ NO ☐
40. Do you usually take the initiative in making new friends? YES ☐ NO ☐
41. Would you call yourself tense or "highly-strung"? YES ☐ NO ☐
42. Are you mostly quiet when you are with other people? YES ☐ NO ☐
43. Do you think marriage is old-fashioned and should be done away with? YES ☐ NO ☐
44. Do you sometimes boast a little? YES ☐ NO ☐
45. Can you easily get some life into a rather dull party? YES ☐ NO ☐

GO RIGHT ON TO THE NEXT PAGE.

46. Do people who drive carefully annoy you? YES ☐ NO ☐
47. Do you worry about your health? YES ☐ NO ☐
48. Have you ever said anything bad or nasty about anyone? YES ☐ NO ☐
49. Do you like telling jokes and funny stories to your friends? YES ☐ NO ☐
50. Do most things taste the same to you? YES ☐ NO ☐
51. As a child did you ever talk back to your parents? YES ☐ NO ☐
52. Do you like mixing with people? YES ☐ NO ☐
53. Does it worry you if you know there are mistakes in your work? YES ☐ NO ☐
54. Do you suffer from sleeplessness? YES ☐ NO ☐
55. Do you always wash before a meal? YES ☐ NO ☐
56. Do you nearly always have a "ready answer" when people talk to you? YES ☐ NO ☐
57. Do you like to arrive at appointments in plenty of time? YES ☐ NO ☐
58. Have you often felt listless and tired for no reason? YES ☐ NO ☐
59. Have you ever cheated at a game? YES ☐ NO ☐
60. Do you like doing things in which you have to act quickly? YES ☐ NO ☐
61. Is (or was) your mother a good woman? YES ☐ NO ☐
62. Do you often feel life is very dull? YES ☐ NO ☐
63. Have you ever taken advantage of someone? YES ☐ NO ☐
64. Do you often take on more activities than you have time for? YES ☐ NO ☐
65. Are there several people who keep trying to avoid you? YES ☐ NO ☐
66. Do you worry a lot about your looks? YES ☐ NO ☐
67. Do you think people spend too much time safeguarding their future with savings and insurances? YES ☐ NO ☐
68. Have you ever wished that you were dead? YES ☐ NO ☐
69. Would you dodge paying taxes if you were sure you could never be found out? YES ☐ NO ☐
70. Can you get a party going? YES ☐ NO ☐
71. Do you try not to be rude to people? YES ☐ NO ☐
72. Do you worry too long after an embarrassing experience? YES ☐ NO ☐
73. Have you ever insisted on having your own way? YES ☐ NO ☐
74. When you catch a train do you often arrive at the last minute? YES ☐ NO ☐
75. Do you suffer from "nerves"? YES ☐ NO ☐
76. Do your friendships break up easily without it being your fault? YES ☐ NO ☐
77. Do you often feel lonely? YES ☐ NO ☐
78. Do you always practice what you preach? YES ☐ NO ☐
79. Do you sometimes like teasing animals? YES ☐ NO ☐
80. Are you easily hurt when people find fault with you or the work you do? YES ☐ NO ☐
81. Have you ever been late for an appointment or work? YES ☐ NO ☐
82. Do you like plenty of bustle and excitement around you? YES ☐ NO ☐
83. Would you like other people to be afraid of you? YES ☐ NO ☐
84. Are you sometimes bubbling over with energy and sometimes very sluggish? YES ☐ NO ☐
85. Do you sometimes put off until tomorrow what you ought to do today? YES ☐ NO ☐
86. Do other people think of you as being very lively? YES ☐ NO ☐
87. Do people tell you a lot of lies? YES ☐ NO ☐
88. Are you touchy about some things? YES ☐ NO ☐
89. Are you always willing to admit it when you have made a mistake? YES ☐ NO ☐
90. Would you feel very sorry for an animal caught in a trap? YES ☐ NO ☐

PLEASE CHECK TO SEE THAT YOU HAVE ANSWERED ALL THE QUESTIONS

Appendix J  
Shipley Institute of Living Scale (SILS)



## SHIPLEY INSTITUTE OF LIVING SCALE

Administration Form

Walter C. Shipley, Ph.D.

Published by

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 1800 Wilson Avenue  
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Name: \_\_\_\_\_ Sex: M F Age: \_\_\_\_\_  
 Education: \_\_\_\_\_ Usual Occupation: \_\_\_\_\_ Today's Date: \_\_\_\_\_

## Part I

Instructions: In the test below, the first word in each line is printed in capital letters. Opposite it are four other words. Circle the one word which means the same thing, or most nearly the same thing, as the first word. If you don't know, guess. Be sure to circle the one word in each line that means the same thing as the first word.

## EXAMPLE:

LARGE

red

big

silent

wet

- |                 |             |            |            |             |
|-----------------|-------------|------------|------------|-------------|
| (1) TALK        | draw        | eat        | speak      | sleep       |
| (2) PERMIT      | allow       | saw        | cut        | drive       |
| (3) PARDON      | forgive     | pound      | divide     | tell        |
| (4) COUCH       | pin         | crater     | sofa       | glass       |
| (5) REMEMBER    | swim        | recall     | number     | defy        |
| (6) TUMBLE      | drink       | dress      | fall       | think       |
| (7) HIDEOUS     | silvery     | tilted     | young      | dreadful    |
| (8) CORDIAL     | swift       | muddy      | leafy      | beardy      |
| (9) EVIDENT     | green       | obvious    | skeptical  | afraid      |
| (10) IMPOSTOR   | conductor   | officer    | book       | pretender   |
| (11) MERIT      | deserve     | distrust   | fight      | separate    |
| (12) FASCINATE  | welcome     | fix        | stir       | enchant     |
| (13) INDICATE   | defy        | excite     | signify    | bicker      |
| (14) IGNORANT   | red         | sharp      | uninformed | precise     |
| (15) FORTIFY    | submerge    | strengthen | vent       | deaden      |
| (16) RENOWN     | length      | head       | fame       | loyalty     |
| (17) NARRATE    | yield       | buy        | associate  | tell        |
| (18) MASSIVE    | bright      | large      | speedy     | low         |
| (19) HILARITY   | laughter    | speed      | grace      | malice      |
| (20) SMIRCHED   | stolen      | pointed    | embellish  | adorn       |
| (21) SQUANDER   | tease       | belittle   | cut        | waste       |
| (22) CAPTION    | drum        | ballast    | heading    | ape         |
| (23) FACILITATE | help        | turn       | strip      | bewilder    |
| (24) JOCOSE     | humorous    | pallory    | fervid     | plain       |
| (25) APPRISE    | reduce      | strew      | inform     | delight     |
| (26) RUE        | eat         | lament     | dominate   | cure        |
| (27) DENIZEN    | senator     | inhabitant | fish       | atom        |
| (28) DIVEST     | dispossess  | intrude    | rally      | pledge      |
| (29) AMULET     | charm       | orphan     | dingo      | pond        |
| (30) INEXORABLE | untidy      | involuble  | rigid      | sparse      |
| (31) SERRATED   | dried       | soaked     | armed      | blunt       |
| (32) LISSOM     | moldy       | loose      | supple     | convex      |
| (33) MOLLIFY    | mitigate    | direct     | pertain    | abuse       |
| (34) PLAGIARIZE | appropriate | imend      | revoke     | maintain    |
| (35) ORIFICE    | brush       | hole       | building   | lute        |
| (36) QUERULOUS  | maniacal    | curious    | devout     | complaining |
| (37) PARIAH     | outcast     | priest     | lental     | locker      |
| (38) ABET       | waken       | ensue      | incite     | placate     |
| (39) TEMERITY   | rashness    | timidity   | desire     | kindness    |
| (40) PRISTINE   | vain        | sound      | first      | level       |

Turn over this sheet and continue with Part II when instructed to do so.

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DO NOT WRITE IN THIS AREA

Academy's Score \_\_\_\_\_

## Part II

Instructions: Complete the following by filling in either a number or a letter for each dash ( \_\_\_\_ ). Do the items in order, but don't spend too much time on any one item.

EXAMPLE: A B C D E

- (1) 1 2 3 4 5 \_\_\_\_
- (2) white black short long down \_\_\_\_
- (3) AB BC CD D \_\_\_\_
- (4) Z Y X W V U \_\_\_\_
- (5) 1 2 3 2 1 2 3 4 3 2 3 4 5 4 3 4 5 6 \_\_\_\_
- (6) NE/SW SE/NW E/W N/ \_\_\_\_
- (7) scape scape scape \_\_\_\_
- (8) oh he hat far mood \_\_\_\_
- (9) A Z B Y C X D \_\_\_\_
- (10) tot tot bard drab 537 \_\_\_\_
- (11) mist is wasp as pint in tone \_\_\_\_
- (12) 57325 73265 32657 26573 \_\_\_\_
- (13) knit in sped up both to stay \_\_\_\_
- (14) Scotland landscape scapegoat \_\_\_\_
- (15) surgeon 1234567 shore 17635 rogue \_\_\_\_
- (16) tam tan rib rd sat raw hip \_\_\_\_
- (17) tar pitch throw saoon bar rod fee tip end plank \_\_\_\_ meals
- (18) 5124 82 73 154 46 13 \_\_\_\_
- (19) lag leg pen pin big bog rob \_\_\_\_
- (20) two w four r one o three \_\_\_\_

## Summary Scores

V: Raw \_\_\_\_ T: \_\_\_\_ A: Raw \_\_\_\_ T: \_\_\_\_ Total: Raw \_\_\_\_ T: \_\_\_\_  
CQ: \_\_\_\_ AQ: \_\_\_\_ Est. IQ: \_\_\_\_

Appendix K  
Verbal Stimuli

Verbal Stimuli

	<u>Stimuli</u>	<u>Length</u>	<u>Frequency</u>
Emotion	large	5	(43)
	heavy	5	(38)
	plump	5	(1)
	chubby	6	(1)
	obese	5	(1)
	pudgy	5	(1)
	overweight	10	(3)
	blubber	7	(1)
	cellulite	9	(1)
	fat	3	(47)
	figure	6	(202)
	weight	6	(22)
-----			
Non- Emotion	fair	4	(113)
	complexion	10	(21)
	build	5	(211)
	stature	7	(2)
	physique	8	(1)
	shoulder	8	(20)
	brunette	8	(1)
	knee	4	(1)
	finger	6	(1)
	elbow	5	(1)
	ankle	5	(1)
	shin	4	(1)
-----			
Neutral	post	4	(84)
	pear	4	(8)
	powder	6	(28)
	boulder	7	(11)
	nutmeg	6	(4)
	purchase	8	(47)
	brown	5	(176)
	cruise	6	(2)
	shampoo	7	(2)
	wardrobe	8	(8)
	chronicle	9	(5)
	storeroom	9	(1)

Appendix L  
Memory Questionnaire

Subject # \_\_\_\_\_

## Memory Questionnaire

In the spaces provided below, please write all of the words that you can recall from the imagination task. If you are not sure, try to make your best guess. You will have ten minutes to complete the list. You may list the words in any order you wish.

- |     |     |
|-----|-----|
| 1.  | 15. |
| 2.  | 16. |
| 3.  | 17. |
| 4.  | 18. |
| 5.  | 19. |
| 6.  | 20. |
| 7.  | 21. |
| 8.  | 22. |
| 9.  | 23. |
| 10. | 24. |
| 11. | 25. |
| 12. | 26. |
| 13. | 27. |
| 14. | 28. |

Appendix M  
Scoring Guide for Memory Questionnaire

Verbal Stimuli: Acceptable Responses

Responses	
Emotion	large heavy plump chubby obese, obesity pudgy overweight blubber cellulite fat figure weight, weighed, weighing
Non-Emotion	fair complexion build stature physique shoulder, shoulders brunette, brunettes knee, knees finger, fingers elbow, elbows ankle, ankles shin, shins
Neutral	post, posts pear, pears powder, powdered, powdering boulder, boulders nutmeg purchase, purchased, purchasing brown cruise, cruised, cruising shampoo, shampooing, shampooed wardrobe, wardrobes chronicle, chronicled storeroom, storerooms



### Vita

Shannon Buckles Sebastian was born on July 15, 1967, in Lexington, Kentucky. She graduated from Henry Clay High School of Lexington, Kentucky in 1985. She received a Bachelor of Arts degree with highest honors in Psychology in 1989 from the University of North Carolina at Chapel Hill. She received a Master of Arts degree in Clinical Psychology in 1991 from Louisiana State University. She is currently a candidate for the Doctor of Philosophy degree in Clinical Psychology from Louisiana State University, Baton Rouge, Louisiana.

**DOCTORAL EXAMINATION AND DISSERTATION REPORT**


**Candidate:** Shannon Buckles Sebastian

**Major Field:** Psychology

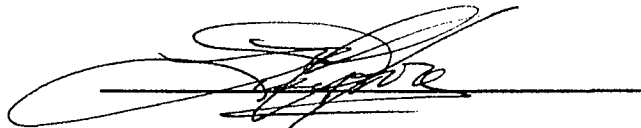
**Title of Dissertation:** Explicit Memory Bias for Body-Related Stimuli  
in Eating Disorders

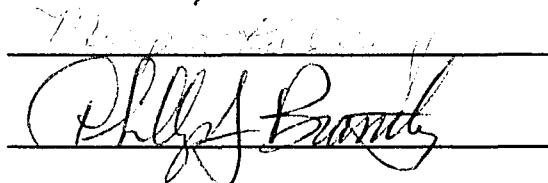
**Approved:**

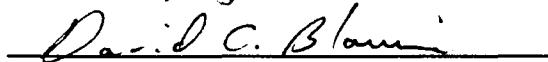
  
Major Professor and Chairman

  
Dean of the Graduate School

**EXAMINING COMMITTEE:**









**Date of Examination:**

5/12/93